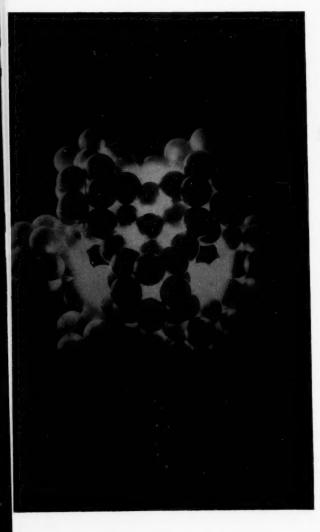
Chemical

Week-

May 24, 1958



Polio vaccine makers protest antitrust indictment, point up drug-pricing perils . p. 29

♠ Cure for rubber-curing ills. Molecular sieves tame too-reactive curing agents . . . p. 51

Esso's 'cleaner' gasoline – payoff on petroleum refiner's radiation research p. 65

Ups and downs of aniline reflect shifting dye, rubber-chemicals demand p. 75

Administered pricing leaves room for competition, purchasing agents hear ... p. 91

WAN WEBOR WICH
213 N 121 ST
0NIVERSITY MICROFILMS 1

there's no substitute for water when you need it!



but when it's t.s.p. you want - switch to...

Westvaco TSP ANHYDROUS and save!

You're pouring money down the drain if you use trisodium phosphate crystals where anhydrous would do just as well. You could save money two ways by switching to Westvaco TSP Anhydrous.

In the first place Westvaco TSP Anhydrous costs less than t.s.p. crystals—\$1.64 less per 100 pounds for the same Na₃PO₄ content. Second, since crystals are 56.9% water,

your shipping costs are 56% higher on crystals than on Westvaco TSP Anhydrous.

Now, we've nothing against water when it's needed. But if you can save two or three dollars per hundred pounds on Westvaco TSP Anhydrous, why not do it?

Your nearest Westvaco office will gladly figure the exact arithmetic for you so you can start saving now.

Putting Ideas to Work



General Sales Offices: 161 E. 42nd STREET, NEW YORK 17



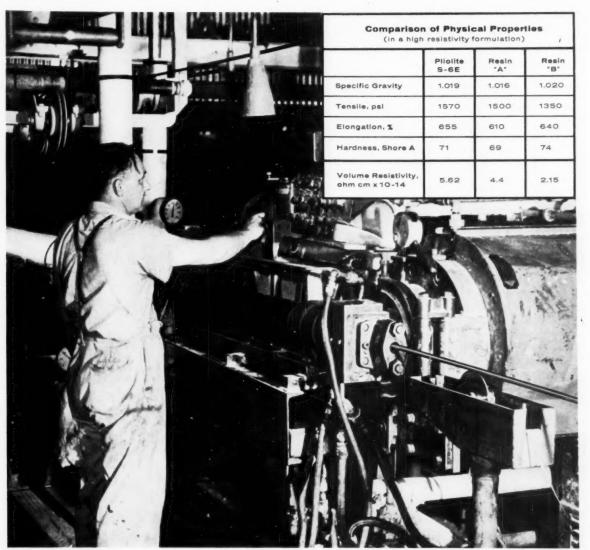


Photo courtesy, The Okonite Company, Passaic, New Jersey

New way to meet tight wire "specs"-with ease!

It's here! PLIOLITE S-6E—the new electrical grade, rubber reinforcing resin that will enable you to meet tight wire covering specifications with ease. In trial plant runs, for instance, PLIOLITE S-6E has been particularly successful in meeting the requirements for covering on HW and RW Wire.

PLIOLITE S-6E is a new high styrene/butadiene copolymer which not only exhibits superior electrical properties (see data above), but also proc-

esses and reinforces on a par with any resin on today's market. And best of all, it's offered at the same price as ordinary reinforcing resins.

We think you'll be pleasantly surprised at just how well PLIOLITE S-6E performs. But the best way to find out is to put it through its paces yourself. Samples and full details, including the latest *Tech Book Bulletins*, are yours by writing Goodyear, Chemical Division, Dept. Q-9417, Akron 16, Ohio.

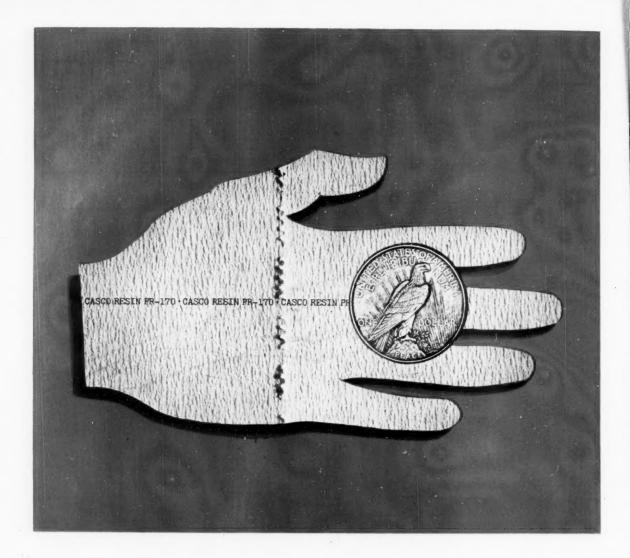


GOODFYEAR

CHEMICAL DIVISION

Pliolite-T. M. The Goodyear Tire & Rubber Company, Akron, Ohio





Borden's Wet Strength Resin Saves You Money!

Casco-Resin PR-170 is Borden's cationic-type urea formaldehyde resin for superior wet strength. Paper manufacturers throughout the country are finding that, properly used, PR-170 yields higher wet strength than competing resins and results in a more absorbent paper. And because of its improved compatibility with other paper chemicals, it is effective on a greater variety of pulps.

Exhaustive laboratory tests plus years of paper mill experience with many customers prove that Borden's PR-170 gives improved wet-dry tensile ratios, scuff resistance, wax pick, wet tear and dry folding endurance. What's more, it imparts a minimum of brittleness to the paper and allows for easy broke recovery.

Casco-Resin PR-170 is another result of Borden's continuous research program designed to help you increase the quality of your paper products and reduce your production costs. Delivery is made in the quantity you need, when you need it from strategically located shipping points throughout the country.

Well-trained technical representatives are ready to assist you in applying Casco-Resin PR-170 to your process immediately. For complete technical information, prices and samples, write The Borden Chemical Company, A Division of The Borden Company, Resins and Chemicals Dept. CW2-58, 350 Madison Avenue, New York 17, N. Y.

Borden Chemical IT'S GOT TO BE GOOD!



TOP OF THE WEEK

MAY 24, 1958

- Two largest American sulfur firms set up joint subsidiary—Texas Gulf Sulphur, Freeport Sulphur establish company, under Webb-Pomerene Act, to handle sulfur sales overseas . . p. 31

21 OPINION

21 MEETINGS

25 BUSINESS NEWSLETTER

- 29 Five makers of polio vaccines protest antitrust action against them. In the spotlight: perils of vaccine and drug pricing.
- 30 CW Index is harbinger of official government figures, new study shows.
- 31 Du Pont presents its plan to comply with antitrust decision; proposes that its stockholders be allowed to vote pro rata share of General Motors stock.

Texas Gulf and Freeport Sulphur set up jointly owned firm to handle sulfur sales abroad.

35 WASHINGTON NEWSLETTER

39 PRODUCTION

Should you shut down your plant at vacation time? "No," say most larger firms; "maybe," say some smaller companies.

51 ENGINEERING

Chemical-loaded molecular sieves make their bow: they're finding application in plastic and rubber curing, as carriers for too-reactive catalysts and accelerators.

61 TECHNOLOGY NEWSLETTER

65 RESEARCH

Esso Research identifies sludgeforming chemicals in gasoline by use of radioactive tracers. Result: a new fuel.

71 MARKET NEWSLETTER

75 MARKETS

Aniline production declines, as output of organic dyes and rubber chemicals dips; but producers view future with optimism, bring in new capacity.

81 ADMINISTRATION

Pulp and paper industry develops new management talent by setting up curriculum for five-year training program at University of Maine.

91 SALES

Administered pricing leaves plenty of room for competition, Chicago purchasing group is told.

96 CHARTING BUSINESS

While independent U.S. oil producers fight mounting imports, others contend that unrestricted imports will conserve domestic reserves.

40,186 copies of this issue printed

Vol. 82

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N.Y. Printed in U.S.A. Second-class mail privileges authorized at Philadelphia, Pa. © Copyright 1938 by McGraw-Hill Publishing Co., Inc. All rights reserved. Subscription: \$3/year in U.S.A., U.S. Possessions; \$4, Canada; \$15, other Western Henisphere countries; \$23, all other countries. Also see p. 21.

Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N. Y.

Convert a gallon of liquid to a powder with 28¢ worth of MICRO-CEL

SYNTHETIC CALCIUM SILICATES

PROBLEMS IN PROCESS formulatings are finding new answers every day in Micro-Cel . . . Johns-Manville's new line of synthetic calcium silicates.

At a delivered cost of 8¢ to 10¢ per pound Micro-Cel can match—even outperform—many higher-priced fillers in dry or liquid products. Check these three cost-cutting product improvements Micro-Cel can give you.

1. MICRO-CEL remains a freeflowing powder even when mixed with more than twice its weight of liquid... provides ultimate absorption of up to six times its weight in water... controls viscosity... prevents caking.

2. IN DRY PRODUCTS, Micro-Cel will bulk up to a full cubic foot for every six pounds. A little Micro-Cel

goes a long way toward improving product density, reducing package outage.

3. MICRO-CEL particles are as small as .02 micron, blend and disperse well, extend pigments to the maximum.

Micro-Cel, the powder that flows like a liquid, is a new line of inert synthetic calcium silicates produced by combining lime with diatomaceous silica under carefully controlled conditions. Its unique combination of properties has already brought important benefits and savings to many processors. Maybe you will be next.

For further information, samples and technical assistance write to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

You can absorb
a gallon of liquid
with 3 lb. of
MICRO-CEL

Johns-Manyille MICRO-CE
A product of the Cell e Division

AMSCO IS

FIRST

in sales

FIRST because . . .

. . . AMSCO offers the most complete line of petroleum solvents in America.

FIRST because . . .

... AMSCO has offices and distributors in more than 34 cities in the U. S., Canada, Mexico. It has refineries and storage terminals at key points providing AMSCO's famous "Service in 48 States".

FIRST because . . .

... AMSCO representatives are experienced, specialized personnel, trained in solvents applications and equipped to serve you better.

FIRST because . . .

... AMSCO research laboratories work constantly to improve present products, and to develop new products better suited to your exact need.



AMERICAN MINERAL SPIRITS COMPANY

NEW YORK • CHICAGO • LOS ANGELES General Eastern Offices, Murray Hill, N.J.

LOOKING FOR A

GROWTH SITUATION?

Shown here are actual production samples of stored, uncoated une prilis made by the CHEMICO process, illustrating their uniform size, shape, extreme whites wishered free-flowing qualities.

Over 3500 tons per day . . . and still mushrooming! That's the story of urea, one of the fastest growing chemicals in the feed, fertilizer and raw plastics fields. With its high nitrogen content, urea gives more plant food value per ton with lower handling costs. In the plastics industry, urea-formaldehyde resins are used extensively as textile and paper treating agents, adhesives, and molding compounds.

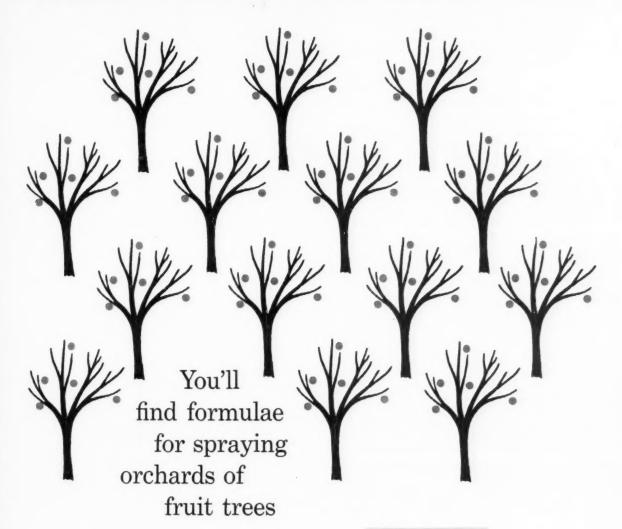
With costs a decisive factor in the urea market, the exclusive CHEMICO process offers increased efficiency, higher yields and a product with a guaranteed 46% nitrogen content. CHEMICO also offers the only commercially available, American-developed process. Before you invest, get the details on the CHEMICO urea process.

CHEMICO

CHEMICAL CONSTRUCTION CORPORATION

A SUBSIDIARY OF ELECTRIC BOND AND SHARE COMPANY 525 West 43rd Street, New York 36, N.Y. • Cable Address: CHEMICONST, New York

CHICAGO . PORTLAND, ORE. . TORONTO . LONDON . PARIS . JOHANNESBURG . TOKYO



...scrubbing acres of floors, washing millions of dishes and cleaning tons of laundry in this *new* Jefferson Surfonic* Technical Bulletin. In addition, you will find suggestions for improving dust-control compounds, concrete additives, textile-processing formulations and numerous other products and processes through the use of Surfonic surface-active agents.

It tells you too, about SURFONIC physical data, analytical procedures, shipping information, handling and storage, among other things.

SURFONIC surface-active agents comprise a broad range of nonionic ethylene oxide adducts of nonyl phenol (SURFONIC N Series) and tridecyl alcohol (SURFONIC TD Series). They range from oil-soluble to watersoluble liquids and waxy solids, and can be blended or reacted to provide a full spectrum of surfactant products.

The complete SURFONIC story is yours for the asking. Send for your copy to Jefferson Chemical Company, Inc., 1121 Walker Avenue, Houston 2, Texas.



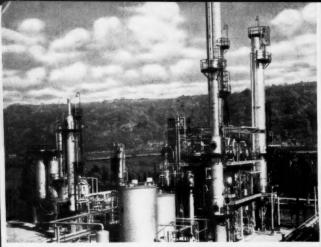


Ethylene Oxide,
Glycols, Dichloride
Ethanolamines
Morpholine
Piperazine
Polyethylene Glycols
Nonyl Phenol
Surfonice
Surface-Active Agents
Ethylene Carbonate
and Propylene Carbonate
Caustic Potash
Caustic Soda
Soda Ash
Sodium Bicarbonate

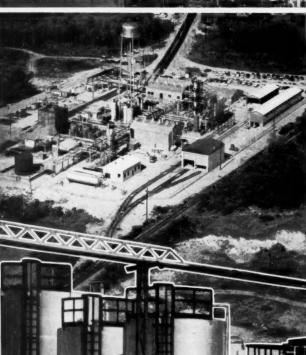
Tefferson CHEMICAL COMPANY, INC.

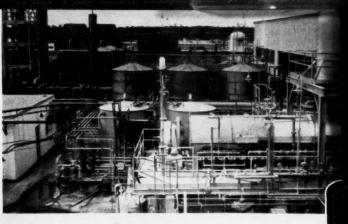
Essential Chemicals from Hydrocarbon Sources

HOUSTON • NEW YORK • CHICAGO • CLEVELAND • CHARLOTTE • LOS ANGELES









They bring the "tough ones" to Badger

On these two pages are shown a few of the difficult projects successfully completed by Badger during the past year.

They were tough, but we did them. As a result of accomplishments like these, Badger's growth in '57 was double the previous year's.

Now, we think we have earned the right to an easy assignment. You have the right to think that if Badger can do the tough ones so well,

Badger can do the easy ones better, too

It's worth investigating — and easy. Key Man Service can be yours in a matter of hours call or write today!



1958 - GOLDEN ANNIVERSARY

Congratulations from Badger on 50 years of achievement. All the Directors of Badger Manufacturing Company are Members of the Institute.

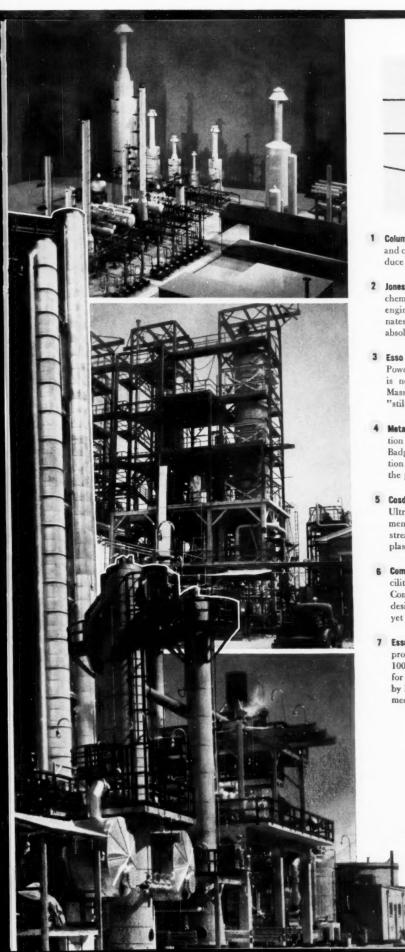
BADGER

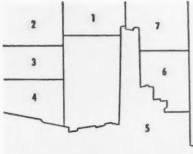
MANUFACTURING COMPANY

ENGINEERS . CONTRACTORS . DESIGNERS . MANUFACTURERS

230 Bent St., Cambridge, Mass. • New York, N. Y. • Houston, Texas
IN EUROPE: Badger-Comprimo N. V., The Hague
Badger-Comprimo S. A., Antwerp







- Columbia-National Corp., Pensacola, Fla. This plant, engineered and constructed for Columbia-National Corporation, will produce 1,500,000 pounds of hafnium-free Zirconium per year.
- 2 Jones & Laughlin Steel Corp., Aliquippa, Pa. Revolution in coal chemicals! For Jones & Laughlin Steel Corporation Badger engineers came up with a new process application that eliminates the conventional acid-washing step to produce near absolute pure benzene and toluene.
- 3 Esso Standard Oil Co., Everett, Mass. One of three current Powerformer projects being handled by Badger. Unit shown is now producing Golden Esso Extra at Esso's Everett, Massachusetts, refinery. Plant was built completely on "stilts" - piles driven deep into tideland marshes.
- 4 Metal Hydrides Inc., Danvers, Mass. A new plant for the production of Sodium Borohydride, a component of "exotic" fuels. Badger handled the engineering, procurement and construction on this job. Plant was ready in record time even though the process was new and tricky.
- 5 Cosden Petroleum Corp., Big Spring, Texas. Styrene from gasoline! Ultra-fractionation and other pioneering process developments made this "impossible" plant a commercial reality. On stream in February 1957, the plant produced better than plastic-grade styrene right from initial start-up!
- Commercial Solvents Corp., Sterlington, La. More methanol facilities. This unit is one of four built in recent years for Commercial Solvents Corporation. Like all methanol units designed by Badger, no chemical purification step is used, yet the product exceeds all present purity specifications.
- Esso Nederland N. V., Rotterdam, The Netherlands. Model of two process units similar to those being installed in a complete 100,000 bpsd refinery, now under construction in Rotterdam for Esso Nederland N. V. Badger-Comprimo, owned jointly by Badger and Comprimo N. V., The Netherlands, is prime mechanical, engineering and construction contractor.

Other current Badger projects

Propane Deasphalting Unit - Anderson-Prichard Oil Corp., Arkansas City, Kansas • MEK Dewaxing-Deciling Plant — Atlantic Refining Company, Point Breeze, Pa. . HF Alkylation Unit -Champlin Oil & Refining Company, Enid, Okla. . Sulfuric Acid Alkylation Unit - Chinese Petroleum Corporation, Taiwan, Formosa . Continuous Tar Distillation Plant* - Dominion Tar & Chemical Co., Ltd., Hamilton, Ontario • Powerforming Unit** — Esso Standard Refinery S. A., Antwerp, Belgium • Tall Oil Plant The Glidden Company, Port St. Joe, Fla. . Benzene Udex Unit-Humble Oil & Refining Company, Baytown, Texas . Tall Oil Plant Monsanto Chemical Company, Nitro, W. Va. . Methanol Plant — Rohm & Haas Company, Houston, Texas • MEK Dewaxing Deoiling Plant - Sinclair Refining Company, East Chicago, Ind. . Vacuum Distillation Unit - Sinclair Refining Company, East Chicago, Ind. . Paraxylene Plant - Sinclair Refining Company, Houston, Texas . Xylene Udex Unit - Sinclair Refining Company, Houston, Texas.

Project of Canadian Badger Company Limited

** Project of Badger-Comprimo N.V., The Netherlands

More proof!

ISOPHTHALIC RESINS are the answer to superior PLASTIC and SURFACE COATING products for industry



Plastic duct made with Isophthalic resins combines light weight with high strength and superior resistance to corrosion. This fiber glass duct, 25 to 36" in diameter, part of a plant's fume control system, will last for years despite constant exposure to corrosive acid fumes. Superior wetting characteristics of Isophthalic resins reduced fabricating costs, provided a stronger laminate.

PLASTICS. Continuing applications in a variety of products are proving Isophthalic resins to be years-ahead in the production of superior reinforced plastics. Isophthalic resin based plastics have greater initial strength and toughness, higher heat distortion temperatures, greater flexural strength, and, their strengths under use conditions are considerably superior to conventional resin based plastics.



Exterior paints made with Isophthalic resins provide better, longerlasting paint jobs. How? Better color retention, faster "quick-dry" and "through-dry", better original gloss and gloss retention, ease of application. Write us for proof.

SURFACE COATINGS. Protective coating formulas developed from Isophthalic resins are becoming the talk of the surface coating industry. Long sought after improvements in coating quality are now possible from properties contributed by Isophthalic resins. Whether you produce or use alkyd flat paints, exterior house paints, baking finishes, industrial finishes or gloss enamels — protective coatings made with Isophthalic resins will do the job far better.

If you would like to know how Isophthalic resins can benefit your products — ask your resin supplier or, contact Oronite directly for complete information on applications, formulations and instructions on their preparation, product samples. Evaluate Isophthalic resins in your own laboratory.



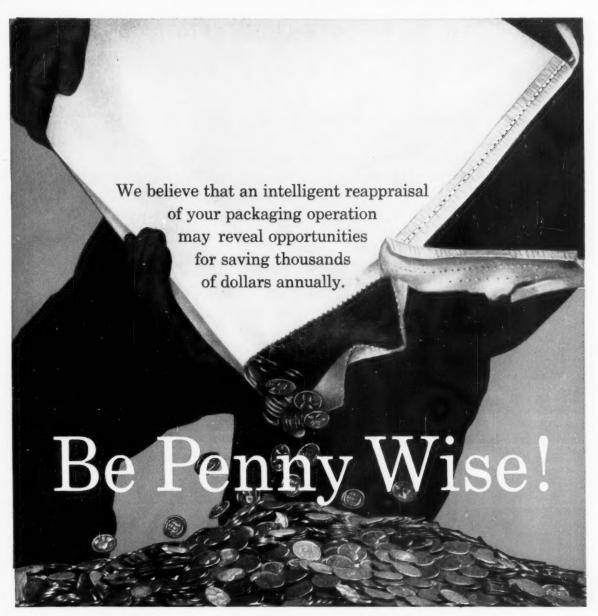
ORONITE CHEMICAL COMPANY

A CALIFORNIA CHEMICAL COMPANY SUBSIDIARY

EXECUTIVE OFFICES • 200 Bush Street, San Francisco 20, California SALES OFFICES • New York, Boston, Wilmington, Chicago, Cincinnati, Cieveland, Houston, Tulsa, Los Angeles, San Francisco, Seattle

Foreign Affiliate: California Chemical International, Inc., San Francisco, Geneva, Panama

4829



IN BUYING MULTIWALL BAGS NO SAVING IS TOO SMALL TO IGNORE!



THE KRAFTPACKER Open Mouth Bag Filling Machine, for free-flowing material, automatically saves pennies, too, through higher production and greater accuracy. Requires a lower investment and maintenance cost than any other automatic machine of its type in use today!

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary 630 Fifth Avenue, New York 20, N. Y. Dally News Bidg., Chicago 6, III.

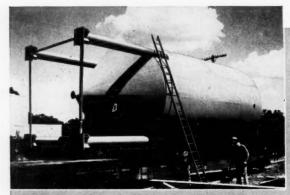
Integrated mills at St. Marys, Georgia and Gilman, Vermont Exclusive Sales Agents for Kraftpacker

		Hilman
	to save on my	Lucian Ca
multiwall bag	packaging.	* St Mora Araft Car * Garnard Tope Do- * The Collaserd Carp * Araft Bay Lorp
COMPANY	************************	May
ADDRESS		
CITY	ZONE	STATE
PRODUCT MFD	*******************	
NAME	*************************	*********************

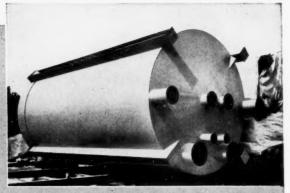
In Custom Fabrication of CODE TANKS and PRESSURE VESSELS

there is no substitute for Experience

Modern Welding offers a wealth of experience in custom fabrication. Our well equipped strategically located plants serve chemical processing and petroleum industries throughout the world. Our facilities are at the disposal of the men who design, construct, operate and maintain processing plants.



Sludge Settler tank for petrochemical plant is the first in this revolutionary new design.



Dual purpose phenolic-lined polyethylene storage tank with structural reinforcements.



Calibration and prover tank for measuring the accuracy of pipeline crude oil meters.



Air receiver tanks for compressor stations. Pressure tested in 450 lbs. of hydrostatic pressure conforming to A.S.M.E. 1952-A code. Each X-ray tested.



MODERN WELDING COMPANY

INCORPORATED

Owensboro, Kentucky

NEWARK, OHIO · ORLANDO, FLA. · HOUSTON, TEXAS · BURLINGTON, IOWA



ULTRAWET 35KX

cuts formulation costs in cotton scouring, wool scouring, soaping-off and dye leveling compounds

Atlantic Ultrawet 35KX is cutting textile processing costs with an impressive combination of skills. This superior alkyl aryl sulfonate can be used in its concentrated form or built into textile processing compounds for the most efficient cotton scouring, soaping-off and dye leveling operations.

Ultrawer 35KX is available in bulk quantity to make a myriad of textile processing compounds. It's particularly easy to handle and store.

All of our Atlantic Ultrawets, which have exceptionally low unsulfonated oil content, provide outstanding cleaning and wetting ability. In concentrations as low as 0.2%, our Ultrawets will thoroughly emulsify animal grease. In concentrations as low as 0.5%, Ultrawets can speed wetting and dye penetration.

Enhance your position with your customers. Keep them informed on cost-cutting Ultrawets by Atlantic. Ask our sales engineers for sales ammunition. Write or wire Chemicals Division, The Atlantic Refining Company, 260 South Broad Street, Philadelphia 1, Pennsylvania.



PHILADELPHIA

PROVIDENCE

CHARLOTTE

CHICAGO

In Canada: Naugatuck Chemicals Division of Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

In South America: Atlantic Refining Company of Brazil, Rio de Janeiro

PICK ONE WITH EXTENSIVE PROCESS INDUSTRY EXPERIENCE

Choose a firm with a staff and facilities geared to the design, engineering and construction of chemical and petrochemical plants—and with a *proven* record in this area of industry.

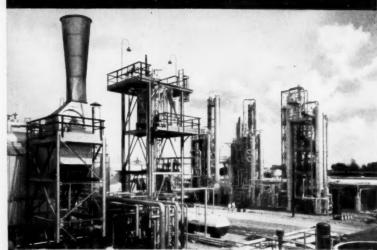
The Lummus Company, for example, has built over 800 chemical process units in the last 50 years. Among them have been the world's largest butadiene plant, the world's first commercial plant to make high-pressure acetylene chemicals, and one of the least expensive anhydrous ammonia plants ever built.

Lummus maintains a staff of highly trained specialists in seven branch offices and subsidiaries throughout the world. They are thoroughly experienced in chemical plant design and construction.

Then, too, Lummus has an Engineering Development Center to bridge the gap between laboratory research and commercial plant operation. The Center has extensive chemical pilot plant facilities in operation, and is equipped for designing and building new pilot units.

Call in Lummus when you begin plans on your next chemical plant.

CHEMICAL PLANTS-A SPECIALTY OF LUMMUS



ABOVE — World's first full-scale, high-pressure acetylene chemicals plant at Calvert City — engineered and constructed by Lummus for General Aniline & Film Corporation.

BELOW-Just a few examples from Lummus' long list of outstanding chemical projects.

PRODUCT Vinyl Acetate

Phenol-Acetone

Anhydrous Ammonia

Phthalic Anhydride Epon Resins

Bisphenol

Tetramer, Cumene, Phenol-Acetone

Sulfuric Acid

Ethylene Oxide-Glycol Ethylene

Beryllium Metal

COMPANY

Air Reduction Chemical Co. Progil-Electrochimie

Food Machinery & Chemical Corp. (Westvaco Chlor-Alkali Division) Pittsburgh Coke

& Chemical Co. Shell Chemical Corp.

Shell Chemical Corp.

Societe des Chimiques des Derives du Petrole Inland Chemicals Canada Ltd. Calcasieu

Chemical Corp. Petroleum Chemicals, Inc. The Beryllium

Corp.

LOCATION

Calvert City, Kentucky Pont de Claix, France South Charleston, West Virginia

Neville Island, Pa.

Houston, Texas

Houston, Texas

Antwerp, Belgium

Fort Saskatchewan, Alberta, Canada Lake Charles, La.

Lake Charles, La.

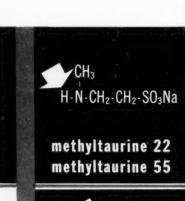
Ashmore. Pa.

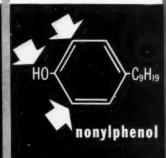


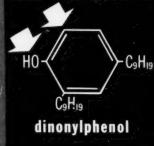
THE LUMMUS COMPANY, 385 MADISON AVENUE, NEW YORK 17, N.Y.

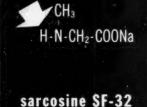
WASHINGTON, D. C. . CHICAGO . HOUSTON . MONTREAL . CARACAS . MARACAIBO . LONDON . PARIS . THE HAGUE

highly reactive bulkproduced intermediates





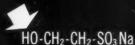




for making

SURFACTANTS
VINYL STABILIZERS
LUBE-OIL ADDITIVES
DISINFECTANTS AND
GERMICIDES
DIAZONIUM COMPOUNDS
PHARMACEUTICALS
RUBBER CHEMICALS
ORGANIC SOLVENTS
ANTIOXIDANTS

and other products



sodium isethionate



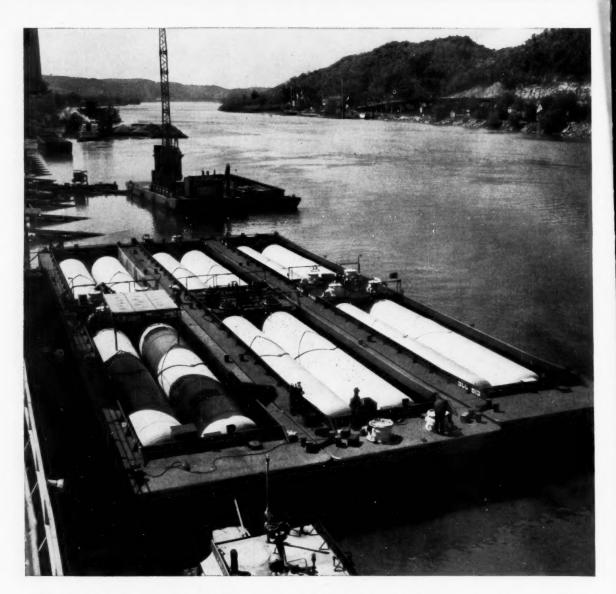
From Research to Reality

ANTARA, CHEMICALS

GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET . NEW YORK 14, NEW YORK

SALES OFFICES. New York * Providence * Philadelphia * Charlotte * Chartanooga * Chicaga Portland, Ore, * San Francisco * Los Angeles. IN CANADA: Chemical Developments of Canada, Ltd., Mantreal Profitable new products lie hidden where white arrows mark the sites of maximum reactivity. Reach for new markets by creating improved chemicals from these versatile bulk intermediates. Write for more information and technical literature today.



Three more 620-ton Dravo chlorine barges join Stauffer Chemical's river fleet

Three new Dravo-built liquid chemical barges, each capable of carrying more chlorine than a dozen railway tank cars, have recently joined the river fleet of the Stauffer Chemical Company of New York.

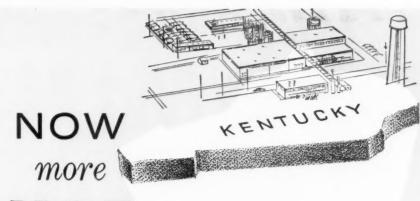
Along with three similar barges launched in 1955, the new 175-foot barges are used to transport liquid chlorine from plants on the Ohio, Tennessee, and Cumberland rivers to a Stauffer processing plant at Louisville, Kentucky.

Four cylindrical steel tanks, mounted in each of the 26-foot-wide

barges, hold up to 620-tons of chlorine under 125-pounds pressure. This internal pressure makes unloading a quick, easy process.

In the past 40 years, Dravo has built more than 3700 hulls of all types. This experience in hull design and marine construction means that Dravo barges give easier towing, greater cargo capacity, and extremely low maintenance. For more information on how this experience can be used to increase your profits, contact: Dravo Corporation, PITTSBURGH 25, PA.

DRAVO



M&T CHEMICALS



... from a new plant

Latest addition to Metal & Thermit manufacturing facilities is a unique, multi-million dollar chemical plant just opened in Carrollton, Ky. Engineered and constructed for the production of organometallic compounds based on tin and many other metals—it

provides industry with a most varied and complete source of organometallics.

Inquiries on these and other M&T Chemicals are invited. For a complete list, refer to our insert in Chemical Materials Catalog or write us for a copy of booklet C-57. Also available on specific request is a 24 page booklet entitled "The Metal & Thermit Story"

METAL & THERMIT

CORPORATION

GENERAL OFFICES: RAHWAY, NEW JERSEY

METAL & THERMIT-UNITED CHROMIUM OF CANADA, LIMITED . REXDALE, ONT.

INORGANIC TIN CHEMICALS
ORGANOTIN CHEMICALS

ZIRCONIUM CHEMICALS
ANTIMONY CHEMICALS

METALS & ALLOYS

ORGANOMETALLIC CHEMICALS

PLATING CHEMICALS & PROCESSES



FLAME-PROOF with

For plastics, textiles, fluids, protective coatings, paper and wood products . . . Four new brominated flame-proofing compounds.

> BrCH, CHBrCH, O. BrCH, CHBrCH, O-BrCH, CHBrCH, O.

TRIS (2,3-DIBROMOPROPYL) PHOSPHATE

Bromine content: 68.7 %

APPLICATIONS:

- To flame-proof polystyrene foam and other foamed systems.
- As a secondary plasticizer in vinyls to impart flame-retardancy.

 To flame-proof cotton and rayon.

- Outstanding flame-proofing properties may be produced in cutting oils. As a flame-proofing additive in spray-coating lacquers for paper and wood products. High dielectric constant suggests its use in the electrical field (transformers, switches, potting formulations).



PENTABROMOPHENOL

Bromine content: 81.8%.

APPLICATIONS:

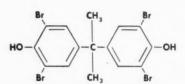
- To flame-proof wall board, piers, telephone poles and other structural wood forms.
- To provide termite control in wood structures.
- · As the flame-proofing agent in phenolic resins.
- Presents promise in anti-fouling paints for marine
- As a mildew preventative in resins.



TETRABROMOPHTHALIC ANHYDRIDE

Bromine content: 68.9 %

- As a flame-proofer in the manufactuer of polyamide resins for electrical insulation.
- Can be reacted with polyhydric alcohols to impart flame-proof properties in polyester resins and in the manufacture of alkyd resins for protective
- As a curing agent in the manufacture of epoxy
- In the manufacture of novel phthalein dyes.



TETRABROMOBISPHENOL-A

Bromine content: 58.8 %

APPLICATIONS:

- In the manufacture of flame-proof epoxy foams and coatings.

 To reduce flammability in polyurethane and
- May lead to flame-proof polyester resins by re-action with dibasic acids.
- May give unusual polycarbonate resins.

BROMINATED COMPOUNDS are several times more efficient than their chlorine analogs for flame-proofing. This superiority is fundamental rather than one of degree, and it is why these compounds may increase the fire-resistance of your plastics, textiles, fluids, protective coatings, paper and wood products.

The flame-proofing advantages of these new Michigan Chemical compounds permit the use of smaller quantities than would be required with chlorine compounds. As a result, there will be less disturbance of the physical properties and appearance of the end product.

Michigan Chemical can now furnish testing quantities of these new compounds. Your letterhead request for samples or data will re-

ceive prompt attention.



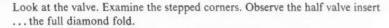
MICHIGAN CHEMICAL CORPORATION

577 North Bankson Street, Saint Louis, Michigan

EASTERN SALES OFFICE: 230 Park Avenue . New York 17, New York



Any way you look at it... No Multiwall can top the Crown Stepped-End in performance.



Anywhere you look, the Crown Stepped-End bag proves itself to be one of the biggest steps forward in Multiwall packaging in recent years. Here are six big advantages you get with Crown Stepped-End:

STRONGER: Stepping the plies offers a stronger bond than sewn bags, reduces chances of breakage by sudden blows.

MORE FLEXIBLE: Stepped corners and full diamond fold give bag more flexibility, reducing breakage.

EASIER VALVING: Half valve insert and full diamond fold make one-hand valving possible, speeds production.

POSITIVE CLOSURE: Positive closure on corner opposite valve prevents blow-out while valving.

EASY HANDLING: Crown's Stepped-End, when filled, makes a compact square package, stacks better, handles easier.

PRINT BOTH ENDS: Stepped-End allows you to print both ends, as well as the face and gusset—thus providing more advertising area for your brand design or message, easier identification in storage.

Our salesmen are supplied with sample Stepped-End bags which they will be glad to demonstrate in person. Call or write:

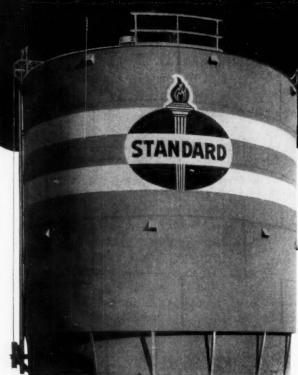


CROWN ZELLERBACH CORPORATION

SALES OFFICES: ATLANTA • BIRMINGHAM • CHICAGO • COLUMBUS • DALLAS • DENVER • HOUSTON • KANSAS CITY LOS ANGELES • MINNEAPOLIS • NEW ORLEANS • NEW YORK • PORTLAND • SALT LAKE CITY • SAN FRANCISCO • SEATTLE • ST. LOUIS HYDROGEN · OXYGEN · ETHYLENE ACETYLENE · NITROGEN · METHANE HELLUM · ARGON · NEON · FREON ANHYDROUS HCL · HYDROGEN SULFIDE

inert gases . . . problem gases

*** WIGGINS GASHOLDER



For complete information, write or call. A General American Sales Engineer will be glad to answer your questions or call upon you at your convenience. STORES THEM ALL!

Only the Wiggins Gasholder uses a patented dry fabric seal.

- · Operates with wide clearances.
- Not affected by weather.
- No corrosion problems—no water, no tar, no grease.
- No complex, unsightly lifts—no water tank, no costly foundation.
- No danger of blow-outs—no frozen pistons.
- No operating costs—simple, safe, practically no maintenance.



PLATE AND WELDING DIVISION

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street . Chicago 90, Illinois

Chemical Week

Wallace F. Traendly	
Sidney D. Kirkpatrick	Editorial Director
Howard C. E. Johnson	Editor-in-Chief
Ralph R. Schulz	
William Olcott As	sistant Managing Editor
J. Robert Warren As	sistant Managing Editor
Donald P. Burke	Associate Editor
Anthony J. Piombino	Associate Editor

DEPARTMENTS

Administration Cooper R. McCarthy, editor; Leo J. Northart
Business News
Engineering Kenneth C. Wilsey, editor; Philip A. Untersee
Markets Jorma Hyypia, editor; Frank S. Sciancalepore
Production Herbert C. Short, editor
Reports Vincent L. Marsilia, editor
Research Joseph F. Kalina, editor; Sanford J. Durst
Sales John M. Winton, editor
Specialties Richard J. Callahan, editor; Mary Thompson
Copy William Mullinack, editor; Henry S. Gordon, John Philbin
Art R. D. S. Marshall, director; Dolores Able
Buyers' Guide Mary C. Folsom, editor; E. L. Sisley

REGIONAL EDITORS

Far West Emil J. Mikity, San Francisco James A. Lee, Houston Southwest Midwest T. Peter Forbath, Chicago

NATIONAL AND WORLD NEWS

Economics	Dexter M. Keezer
Manager, News Bureaus	John Wilhelm
Atlanta Charles T. Dixon	Beirut O. M. Marashian
Chicago Stewart Ramsey	Bonn Morrie Helitzer
Cleveland William Meldrum Dallas Kemp Anderson, Jr.	Caracas John Pearson
Detroit Donald MacDonald	London William J. Coughlin
Los Angeles John H. Kearney	Melbourne Alicja Grobtuch
San Francisco Margaret Ralston	Mexico City Peter Weaver
Seattle Ray Bloomberg	Paris Robert E. Farrell
Washington George B. Bryant, Jr.	Tokyo Sol Sanders



Correspondents in 75 principal cities.

Robert S. Muller	Advertising Sales Manager
Business Department Sales Promotion Department	
Market Service Manager Advertising Makeup	Margaret J. Swikart
Advertising Salesmen	
Paul W. Erb	Circulation Manager

Frances Regan MAY 24, 1958 Vol. 82, No. 21

Chemical Week (including Chemical Specialities and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948) founder EXECUTIVE, EDITORIAL, CIR-GULATION AND ADVERTISING offices; McGraw-Hill Building, 330 West 42nd 8t., New York 36, NY, Publication office; 3rd & Hunting Park Ave, Philadelphia 40, Pa. See panel bow for directions regarding subscriptions or change of address Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President of Vice-President and Treasurer; John J. Cooke, Secretary: Nelson Bond Executive Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Director of Advertising Sales; A. R. Venezian, Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing, Position and company connection must be indicated on subscription application. Send to address shown in panel below.

United States and United States possessions subscription rate for individuals in the field of the published of the published of the published of the published of the publishing of the publishing

Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week, 339 West 42nd St. New York 36, N. Y. Subscribers should notify Fulfillment Manager, Chemical Week, of any change of address, giving old as well as new address, and including postal zone number, if any, if possible, enclose an address label from recent issue of Chemical Week. Please allow one month for change to become effective.

OPINION

Ultrasonic Sonex

TO THE EDITOR: I have read with great interest the article concerning ultrasonic detergents (Feb. 1, p. 55), in which Acoustica is credited with the introduction of "the first liquid detergent designed strictly for ultrasonic cleaning units." . . .

W. D. MacDermid Chemical Co. has for more than two years been marketing (under the Sonex brand) detergents designed specifically for ultrasonic cleaning. Research and developmental activities in the area of ultrasonic cleaning date back three vears, during which a wealth of information regarding ultrasonic cleaning has been amassed. . . .

> R. J. CICHON W. D. MacDermid Chemical Co. Bristol, Conn.

Where's Aberdeen?

To the Editor: I wish to draw to your attention a glaring and insulting mistake (Feb. 22, p. 64). At the foot of the page you refer to Aberdeen University being situated in England.

This shocking statement has forced me to enlighten you as to the geographical location of Aberdeen, which I should inform you is in Scotland.

Several years ago, the Scots ceased to paint themselves with woad and live in caves, and over a period of time have built themselves an educational system second to none. We are very proud of this system, especially our universities, of which Aberdeen is an example, and any reference to associating such a stronghold of learning with those Sassenach prigs south of the border raises the temperature of any Scotsman's blood.

I trust we shall have no recurrence of this unfortunate mistake.

> ALEX KERR Toronto, Ont.

We perfunctorily followed the Army's error, and we apologize.-ED.

MEETINGS

American Management Assn., 27th national packaging conference, Hotel Statler, New York, May 26-28.

American Institute of Mining, Metallurgical and Petroleum Engineers, Niagara Frontier Section, third annual reactive metals conference, Hotel Statler, Buffalo, New York, May 27-29.

Correspondents in 61 principal cities.



The lighter side of paint \dots where pigmentation is involved \dots calls for <code>TITANOX*</code> titanium dioxide white pigments—first choice among paint makers.

For TITANOX white pigments are adaptable to any type of coating, from delicate trade sales color systems to durable industrial product finishes. Unsurpassed in whitening, brightening and hiding power, plus ease of dispersion, TITANOX pigments also lighten the burden of paint processing. In fact, TITANOX pigments lighten pigmentation problems in plastics, rubber, paper, ceramics or anything that needs white pigment. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities.

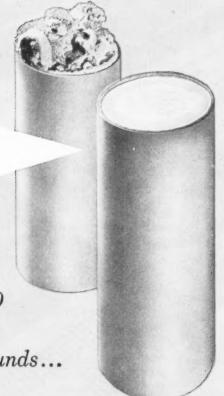


TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

you too can profit from stability in Stearic Acid



here's how Emersol® 120 eliminated failures in lime buffing compounds...

The illustration on the right is that of a good lime buffing compound. The one at left is one in which a reaction has occurred that makes the product useless. Why do such failures occur occasionally when made with some double-pressed stearic acid and not with Emersol 120? The first obvious answer is moisture...which causes the lime to react with the stearic to form a soap. But, failures occur even on completely dry material.

Upon analyzing many such samples that failed, there was one significant difference—the presence of substantial quantities of peroxides that are a result of oxidation of the stearic acids. Though the basic cause of such a reaction is not completely understood, the relation to peroxides was verified by many tests. Thus, the reason for the satisfactory performance of Emersol 120...its outstanding oxidation-stability minimizes the formation of peroxides and thus prevents such reactions.

While this is only one example, it emphasizes the importance of stability in stearic acids. In other products also, the results can be devastating. It can mean rancidity, yellowing, changes in texture, breakdown in emulsions and a general deterioration of performance. But, these pitfalls can be avoided easily and at no extra cost by letting the outstanding stability of Emersol Stearic Acids keep your products as fresh as the day they were made.

So, why risk your product's good reputation when it is so easy to specify the Emersol brand when you order stearic acids?

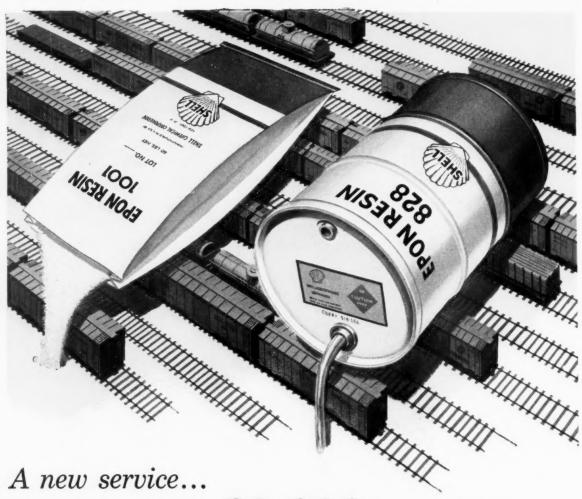


Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio New York; Philodelphia; Lowell, Mass.; Chicago, San Francisco, Cleveland, Ecclestone Chemical Co., Detroit

Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles

Export: Carew Tower, Cincinnati 2, Ohio
In Canada: Emery Industries (Canada) Ltd., 639 Nelson St., London, Ontario

Emery Industries, Inc. Dept. 1-5, Carew Towe Cincinnati 2, Ohio	er																		
Please send in your ne "Emersol Stearic Acids".		2	4.	p	a	g	е	E	n	16	er	Y	f	a	C	t:	ti	t	•
Name		* *				Ti	tle												
Company																			•
Address													*						



Epon® Resin in 30,000 pound lots...

for substantial savings!

Here's welcome news for production men who want to bring down the cost of maintaining uniformity of their products! Now, each of six different types of Epon resin are available in single manufacturing lots of 30,000 pounds. These include Epon 815, 820, 828, 1001, 1004 and 1007.

HERE'S HOW carload lots offer SAVINGS:

1 You save substantially in time and labor on inventory control—in addition, Shell's "one-man lift" 50-lb. paper bags for Epon 1004 and 1007 help speed

in-plant handling . . . and are color-coded for instant identification of contents.

2 You save control lab time—only one evaluation of incoming resin is needed per carload, whereas small lot production may require 8-10 analyses.

3 You cut manufacturing costs by increasing the uniformity of raw materials used in your products, thus reducing the day-to-day adjustment of formulations to account for batch variation in ingredients. For additional information, write to the Shell Chemical district office nearest you.

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver



Business Newsletter

CHEMICAL WEEK

Here's later (see p. 31) reaction on Du Pont's opposition to GM divestiture plans, as proposed by U.S. attorneys.

On Wall Street, investment analysts agree with Du Pont's contention that wholesale distribution of its 63 million shares of General Motors stock would markedly depress prices of both Du Pont and GM, make it difficult for both companies to raise new capital in the stock market.

In a letter to stockholders, Du Pont President Crawford Greene-walt claimed that over the 10-year period of stock distribution, GM stock value would drop 25-40% and Du Pont about 15%. He further said that this loss in value, added to federal taxes (on individual and corporate Du Pont shareholders), could total \$5.9 billion.

Wall Streeters agree that it would be a tough job to find underwriters willing to handle stock issues of the magnitude projected—\$74 million/year for 10 years—by the government plan.

In Washington, too, there was comment on Du Pont's announcement. Antitrusters claim that Du Pont interests control some 75% of Christiana Securities—about 50% through direct holdings, including Delaware Realty, and 25% through trusts controlled by the du Pont family. Thus, voting rights to GM stock passed on to individual stockholders in these companies could be kept tightly controlled—so the reasoning goes—by du Pont family and management.

Du Pont states that voting would be diluted among 4,000 stock-holders of Christiana and Delaware Realty; this is a meaningless number, insist antitrusters, since most of them exercise little independent control.

In addition, government attorneys point out that members of the du Pont family, who own much Du Pont stock directly (not through Christiana and Delaware), would pick up additional GM voting rights through these holdings. Each Du Pont share, under the company proposal, would be equivalent to 1.38 GM shares; the same goes for votes.

In all, then, antitrusters estimate that under the Du Pont proposal, roughly 40-50% of all voting rights in the GM stock now held by the Du Pont company would wind up in the hands of the du Pont family.

Has Du Pont put this plan forward as a tactic in a broader strategy of negotiating a settlement somewhere between the government proposal and its own? It's a possibility that can't be overlooked. The schedule from now on: GM will comment about June 15 on a decree, and expectations are that it will go along with Du Pont's proposal. Forty-five days later, friends of the court, representing Du Pont and GM stockholders, will file their comments. Another 30 days and the government will file comments on all that has passed before.

Business

Newsletter

(Continued)

Judge Walter La Buy, of Chicago federal district court, indicates he will schedule a hearing sometime in the fall to take testimony on the various proposals. La Buy is charged with arriving at a final settlement.

The aerosol industry keeps right on growing.

Number of units filled increased 22% last year, according to the annual survey by Chemical Specialty Manufacturers Assn. The findings—made public this week in Cincinnati, where CSMA was holding its 44th midyear meeting—add up to a total of 390 million units, with \$390-million retail value, compared with the 1956 total of 320 million.

Biggest numerical gain last year was in hair sprays—up 18.5%, from 79.6 million in '56 to 94.4 million in '57. Next-largest increase: pigmented and metallic paints, up from 19.6 million to 30.5 million.

Fastest-growing items are clear plastic sprays, medical and pharmaceutical, and colognes and perfumes. Production of these aerosol products more than doubled last year.

Only aerosol items that declined from '56 to '57 were insecticides, mothproofers and artificial snow.

Despite the current rash of bearish news in the metals business, scattered notes of optimism are beginning to emerge:

- Kennecott Copper Corp. reveals it will spend \$7-8 million to boost capacity of its newly acquired electrolytic refinery at Garfield, Utah (CW Business Newsletter, May 10) to about 21,000 tons/month.
- Ormet Corp. has started production at its aluminum smelter near Clarington, O. Ormet reports the \$110-million unit—now 80% complete—will be finished early in '59, will turn out 180,000 tons/year.
- Howard Perkins, president and chairman of Brooks & Perkins Co. (Detroit), seeing a "fairly substantial" upturn for magnesium later this year, says the company will start construction of a \$4.5-million magnesium reduction plant near Selma, Ala.
- \bullet International Nickel Co. will up the capacity of its Huntington, W. Va., cold-drawing unit 50% , at a cost of \$3.5 million.
- Metal & Thermit President H. E. Martin expects '58 sales to be slightly above 1957's. Profits, however, says Martin, will be off about 14%.

It's chemicals for economic stability. Though the number of business failures in all industries rose 8% last year, according to Dun & Bradstreet, failures of chemical companies dropped 10%.

BRIEFS for buyers of

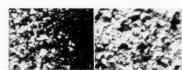
Aluminum Chloride Potassium Chlorate Phosphorus Pentasulfide Benzoyl Chloride

Why we air-condition aluminum chloride. Ever notice how aluminum chloride kicks up in rainy weather?

This widely-used chemical reacts swiftly with humid air, losing its value as a catalyst or reactant. On damp days, your production people have to use extra caution to keep it sealed up tight.

This problem bothers us, too-or used to. In fact, there was a time when we didn't even try to make aluminum chloride on humid days.

Air conditioning came to the rescue. Now we can make aluminum chloride, anhyd., all year long in a controlled dry atmosphere-so you can always get it at full strength, come rain or shine.



You can get Hooker aluminum chloride in any of the four sizes shown here. For technical data, just check the coupon.

Specialization: extreme case

Maybe the point of this piece is that you never know how a Hooker chemical can help you-until you try it.

At any rate, we've just published



new data sheets on two products you'll probably never buy. They're very useful, but very specialized.

One of them is Hooker potassium chlorate. There's a little of it in the heads of three out of every five safety matches made in this country.

The other is Hooker potassium perchlorate. Even more exclusive, it goes almost entirely into railway fusees and fireworks.

How our specialization can help you

Perhaps your need for a chemical is as specialized as this. Perhaps our new, wider diversity includes an existing product or process that can help you meet this need.

To find out, why not ask us?

Phosphorus pentasulfide: old horse, new blanket

Combine elemental phosphorus with sulfur-as we have been doing for more than 50 years-and you get some interesting results.

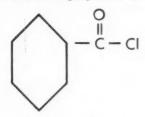
One of them is phosphorus pentasulfide, P2S5. This chemical was first developed in this country to make flotation reagents for copper ore. A considerable volume of it goes into special motor oil additives.

Most recently, it is helping to raise the curtain on a new field of synthesis -phosphorus-containing insecticides.

To assure good supply and fast service, we make phosphorus pentasulfide in two plants-at Niagara Falls, N. Y., and Columbus, Miss. It's available as powder in three different particle sizes, and as a fused solid. Phosphorus content is 27.8% minimum.

For current technical data sheet, check the coupon.

Benzoyl chloride -99% pure available in large quantities



If you ever have need for a highly pure source of benzovl groups, our data sheet on Hooker benzoyl chloride will delight

Ours is a clear, colorless liquid that assays 99% pure benzoyl chloride on a hydrolyzable chlorine basis.

It makes a fine carrier of the benzoyl group for Friedel-Crafts reactions* and as an intermediate for such chemicals as benzoyl peroxide, benzophenone, and benzyl benzoate.

You can get it in five- and thirteengallon carboys and in 55-gallon nickel or lacquer-lined steel drums.

For Friedel-Crafts reactions we offer a large group of chloro aromatics, some of them men-tioned below in the coupon, and aluminum chlo-ride for catalytic use.

Check the coupon for data.

For more information on c	hemicals mentioned on this page, check here:
Aluminum Chloride	☐ Benzoyl Chloride

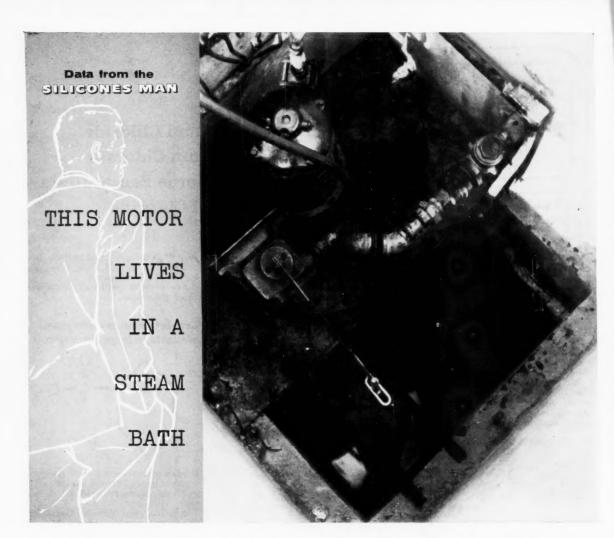
- ☐ Potassium Chlorate
- ☐ Potassium Perchlorate
- ☐ Phosphorus Pentasulfide
- ☐ Benzyl Chloride
- meta-Nitrobenzoyl Chloride
- para-Nitrobenzoyl Chloride

HOOKER ELECTROCHEMICAL COMPANY

705-2 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.

Sales Offices: Chicago Los Angeles New York Niagara Falls
Philadelphia Tacoma Worcester, Mass. In Canada: Hooker Chemicals Limited, North Vancouver, B. C.





When water accumulates in an underground steam distribution system this pump goes to work. But during periods of heavy rain, the water rises and covers the pipes, giving off clouds of steam. Failures were frequent. Since rewinding to Class H specifications using UNION CARBIDE R-620 Silicone Insulating Resin, there has not been a single failure! Time and time again, where a motor is subjected to high temperatures, corrosion, overloads, or dirt, the answer has been found in Class H insulation.

You can easily give your rewind customers all the advantages of Class H insulation, because R-620 Silicone Insulating Varnish is as simple to use as ordinary varnishes. For example, at 450 deg. F., a Class H motor would cure

Unlocking the secrets of silicones
Rubber, Monomers, Resins, Oils and Emulsions

"Union Carbide" is a registered trade-mark of UCC.

in less time than a Class B motor of the same size at 300 deg. F. The time consuming step-bystep curing cycles required by earlier materials are eliminated.

Union Carbide R-620 is easily adapted to your shop practice. You will find that it gives a hard, tough, yet flexible finish. The proper viscosity is built in, eliminating frequent solvent additions. No additional treatments are required to protect against moisture or corrosive atmospheres.

Find out more. Write for the booklets, "UNION CARBIDE Silicones for Dependable Service" and "More for your Silicones Dollar." Address Silicones Division, Dept. L-54, Union Carbide Corporation, 30 East 42nd Street, New York 17, N.Y.



SILICONES

Week



P-D's Loynd: For conquest of polio, 'harassment?'



U.S.'s Hansen: In uniform bids, he sees collusion.

Vaccine Makers Versus the Trust Busters

Last week's indictment of five pharmaceutical firms on charges of polio vaccine price fixing (CW Business Newsletter, May 17) has ignited a controversy that's causing industrywide repercussions.

The five firms, Merck, Eli Lilly, American Home Products, Pitman-Moore and Parke, Davis, all deny collusion charges. They feel their all-out effort to produce the vaccine for a national emergency should have been rewarded by a medal—not a lawsuit.

Some typical comments following last week's indictment:

• From Eli Lilly President Eugene Beesley, "this is complete nonsense. . . . It is incredible that as a postscript to one of our greatest achievements we should have to face this fantastic suit."

• From Merck President John Connor, "There is absolutely no substance to the charge against Merck ... pricing decisions were made independently in conformity with the law and public interest."

• From Parke, Davis President Harry Loynd, "The indictment is a harassing action on the part of the Justice Dept. and clouds the contributions made by the pharmaceutical industry in the conquest of polio."

But these strongly worded replies are only one indication of the companies' disenchantment. The overtones of big profits is another sore spot.

Eli Lilly, by far the biggest producer, poured what it calls a "whole lot of money" into new equipment—as did the other firms—to make the Salk shots. Lilly cleared out a five-story building at its Indianapolis complex, hired several hundred workers to research and make vaccine. Now, it reports, it has more than 24 million doses on hand—which will spoil if

they're not used in the next few months.

No Windfall: Lilly says it made an average profit of 6½ ¢ per dose on the vaccine sold so far. This is believed to be the average return received by other makers. Health & Welfare Dept.'s Division of Biologics Standards reports last week that 262,391,862 doses were sold since April '55.

On the basis of these figures, overall profit comes to \$16.4 million—substantial, but hardly startling when spread over three years and divided among five different companies. Several million of the initial doses, moreover, were supplied at cost for various vaccination programs. And, as one prominent executive pointed out, the cost of doses destroyed, or about to be destroyed hasn't been subtracted from the total.

The five companies also point out that price of the vaccine has been reduced several times since it came on the market. Parke, Davis President Loynd commented: "Since the introduction of polio vaccine in '55, P-D has reduced the price five different times. The present price is less than one-half the original price." Other vaccine producers have cited similar cuts.

Defense Abuilding: At least one of the vaccine makers is reportedly holding personnel meetings to indoctrinate employees on the situation, hoping to gain public support for its case.

Just what evidence the companies will put forth isn't yet known. Government attorneys, of course, aren't revealing results of their investigation. And proceedings before the Trenton, N.J., grand jury are secret.

But it is known that a big boost to Assistant Attorney General Victor Hansen's inquiry came from Milwaukee city fathers who wrote the Justice Dept. to report that 11 vaccine wholesalers had submitted identical sealed bids to the city. One supplier, Wolins Medical and Surgical Supply Corp. (Mineola, N.Y.), submitted a lower bid but later withdrew when it reportedly received a letter from Pitman-Moore, the manufacturer. The letter was alleged to have said that Pitman-Moore wouldn't deliver the shots if they were to be sold at the lower price.

Washington observers are confident that Hansen isn't basing his case on the Milwaukee incident alone. However, other evidence won't be revealed until the trial.

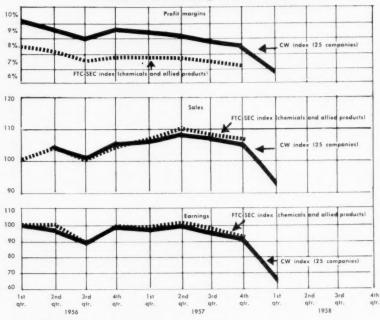
Maximum fine, should the drug firms be convicted, is \$50,000 on each of two counts: (1) price collusion and (2) restraint of trade. But under a '56 law, the government may also sue—in the same manner as a private party—for money damages caused by antitrust violations. Only difference is the government can't sue for triple damages, as private parties may.

Rep. L. H. Fountain (D., N.C.), who started the fur flying at vaccine hearings back in Oct. '56, is pleased with the indictment. He believes a damage suit will result.

Elaborating on a recommendation his subcommittee made last August, Fountain says the vaccine-indictment "should and will lead to a comprehensive and far-reaching investigation into possible price fixing by manufacturers on the sale of other drugs."

CW Index of Sales and Earnings

Chemical Industry Barometers



Here's how the figures graphed above are computed:

SALE AND EARNINGS: Sales of 25 carefully selected chemical companies are totaled for each quarter. Sales for the first quarter of '56 are taken as the base figure and expressed as 100. All other quarters are assigned an index number related to this base. After-tax earnings are computed in the same way.

PROFIT MARGINS: The aggregate after-tax incomes of the same 25 companies are divided by their aggregate sales and the resulting decimal is expressed as a percentage. An average of the individual profit margins would not be statistically meaningful.

No adjustments are made for seasonal changes.

First-Quarter Final Returns

Just how hard has the recession hit the chemical industry? The above sales and earnings indexes*—calculated this week to include late-reporting companies—graphically measure the impact on most segments of the industry: first-quarter sales were down 10.2% and earnings are down 27.8%, compared with those in last-quarter '57. Sharper jolt: first-quarter profit margins slipped from 8.6% (last-quarter '57) to 6.9%.

Compared with the first quarter of '57, sales dropped 11.1% and earnings plummeted 34.1%.

The CW indexes are based on sales and earnings of 25 carefully selected chemical companies, and accurately measure total industry performance. They closely match indexes drawn

from the broader-based Federal Trade Commission-Securities & Exchange Commission data on "Chemicals and Allied Products."

In measuring last year's first-quarter sales and earnings against those of the '56 first quarter, for example, CW's indexes registered a 6% gain in sales and a 1.8% drop in earnings. Indexes based on the government figures showed a 7.3% sales gain, a 1.1% earnings slip.

Both sets of indexes registered the '57 second-quarter sales and earnings peak, and the long slide that followed.

For the prophetic third quarter, CW's index marked a tapering-off at less than 0.1% below second-quarter sales. The government figures showed a 1.7% slip. Fourth-quarter levels on both sales indexes confirmed that the slide was on.

^{*}Recomputed to include amended figures for various companies.

UNITED STATES VS. DU PONT

Comparing the two plans for divestiture of GM stock

Government Plan

Du Pont Plan

Nature Total divestiture of Du Pont Du Pont keeps GM stock, gives GM by distribution and sale of GM stock by a trustee.

Voting Voting of GM stock passes on shareholders.

Income New owners of GM stock would Du Pont and holding companies

Tax Stock taxed on ordinary income No taxes incurred other than (as stock dividend or cash divi-

Timing Divestiture in parcels, approximately one each year for 10

Result Equivalent to issue of \$74 mil- Leaves family and management

company or family interests in up voting rights. Du Pont family limited to voting GM stock as individuals

Voting passes on, pro rata, to with stock to new owners, among stockholders of Du Pont and whom will be individual Du Pont holding companies (Christiana Securities: Delaware Realty).

individually receive dividends to receive income from direct holdings of GM.

> those paid under present ownership status.

> Effective upon court approval. No particular period of time involved.

lion worth of GM stock on open interests with theoretical access market each year for 10 years, to votes on about 8% of ef-Du Pont family or management fectively outstanding GM stock. access to GM votes would be This does not include GM outreduced to unimportant propor- standing stock in reserve for management bonuses.

New Round in an Old Bout

Last week's ruling by the Internal Revenue Service bolsters the Du Pont Co.'s opposition to government proposals that it distribute to stockholders its 63 million shares in General Motors. IRS ruled that the divested stock would be taxable as ordinary income-just as cash is.

Shortly after the IRS ruling, Du Pont revealed its disdain in a memorandum to the federal district court of Illinois in Chicago; this communication laid out the company's plan for eliminating the "reasonable probability" that it might control GM markets for Du Pont products. As expected, approval of Du Pont's plan was quickly registered by Christiana Securities Co. and Delaware Realty and Investment Corp., both large holders of du Pont family interests.

The Plans: In essence, the government plan would require that Christiana's holdings (535,000 shares) in GM be sold outright, and that Du Pont's holdings (63 million shares) in GM be distributed on a pro-rata basis to Du Pont shareholders.

Du Pont's plan calls for the company and Christiana to keep intact their stockholdings in GM, except that voting rights on GM stock would be passed on, pro rata, to Du Pont stockholders; in the cases of Christiana and Delaware Realty-which owns 30% of Christiana-the GM votes would be passed further along to individual shareholders in those firms.

Objections: Du Pont strenuously objects to the government's plan on the grounds that wholesale distribution of such large GM blocks would depress market values of both GM and Du Pont stock; would exact tremendous tax liabilities from Du Pont stockholders; and would punish Christiana Securities and Delaware Realty even though innocent.

Antitrusters were both surprised and disappointed by Du Pont's proposal. Main objection, of course, is that Du Pont interests would still have a voice in General Motors affairs. Likely reasoning: Christiana, Delaware, and Du Pont directors could sway 7.9% of General Motors votes.

Sulfur Prospects Shine

America's two biggest sulfur firms Texas Gulf Sulphur and Freeport Sulphur-are forming a jointly owned company to handle overseas sales. And they're inviting other domestic sulfur companies to come in with them.

In addition, Freeport early next month will sell a major part of its oil & gas interests and will start largescale offshore sulfur drilling.

The subsidiary, Sulphur Export Corp., is being formed under regulations governed by the Webb-Pomerene Act, which permits companies to form a jointly owned subsidiary to sell products overseas. The act stipulates that other companies in the industry must be invited to join.

Sulphur Export is actually a restored corporation. It was formed in '22, but dissolved in '52 when a shortage of sulfur developed. Since '52, Texas Gulf and Freeport have been handling overseas sales separately.

The volume of export sulfur is extensive. Freeport and Texas Gulf report that last year they exported a total of 900,000 tons of sulfur with a market value of about \$24 million. Should the two other major U.S. producers - Jefferson Lake Sulphur and Duval Sulphur & Potash - buy an interest. Sulphur Export's annual business should total well over \$32

Freeport also revealed late last week that it will sell two-thirds of its oil and gas properties. The company wouldn't elaborate on what the sale will bring, but estimated value is \$75 million.

All of the properties to be sold are in the Lake Washington, La., region, where the company owns 89 oil and gas wells. Proved reserves of oil and condensate going on the block total between 52 and 70 million bbls.

June 20 is the date set for opening of bids. Proceeds are slated to be used for developing sulfur and nickel deposits.

A big chunk of the new money is expected to go for large-scale offshore drilling in the Gulf of Mexico. It's well known that onshore deposits near the Louisiana coast are being exhausted. But the discovery of sulfur in an oil field just seven miles at sea off Grand Isle, La., has brightened prospects in the Gulf area.

COMPANIES

Jefferson Lake Sulphur Co.'s affiliate, Jefferson Lake Petro-Chemicals of Canada, Ltd., has filed for registration of 600,000 shares of common stock (\$1 par) and warrants to buy 60,000 additional shares. Proceeds will provide liquid capital for the Canadian firm. Jefferson Lake Petro-Chemicals was set up last December to acquire and operate Jefferson Lake Sulphur's Canadian sulfur holdings. In exchange for its holdings, Jefferson Lake Sulphur will get 69% of the 2 million shares first issued by the Canadian firm.

Dow Chemical Co. will make its wholly owned subsidiary, Dowell Inc. (Tulsa, Okla.), a division on May 31. Dowell's Latin-American subsidiary, United Oilwell Service, S.A., and its Canadian operations will report through the new division.

Cutter Laboratories (Berkeley, Calif.) has acquired Hollister-Stier Laboratories, Inc., and Hollister-Stier Laboratories Co. (both of Spokane, Wash.) through a stock exchange. The firms make allergy-testing and treatment products.

The Glidden Co. (Cleveland) will acquire the paint business of General Paint Corp. (San Francisco), reportedly for \$1.1 million, if stockholders of both firms approve. The deal would include General Paint's brandnames, inventories, processes and plants, but not subsidiary operations in Mexico and the Philippines.

EXPANSION

Liquid Gas: Chemetron's National Cylinder Gas Division has started construction of a \$3-million liquid oxygen, nitrogen and argon plant near Philadelphia. Production is slated to start early in '59 with an initial capacity of 65 tons/day. The plant will pipe oxygen to Alan Wood Steel Co.'s Conshohocken, Pa., plant and supply liquid gases to other East Coast industries.

Isobutylene: Petro-Tex Chemical Corp. (Houston) has started building a high-purity (above 99%) isobutylene plant. Production will start by year's end. Petro-Tex is jointly owned by Tennessee Gas Transmission Co. and Food Machinery and Chemical Corp.

Acrylic Binder: Monsanto's Plastics Division is doubling production capacity for Lytron 680, an acrylic-type binder for latex paints, at its Springfield, Mass., plant. Expansion is expected to be completed next month.

Mineralized Salt: United Salt Corp. (Houston) is completing construction of a plant to produce mineralized salt under a Dow patent. Capacity of the plant, which includes packaging machinery, is 50-million

cartons/year. Initial production of 1.25 cartons/month will include ordinary salt and some packaging for other companies.

Artificial Cryolite: United Heckathorn Co. (Richmond, Calif.) has started building its Garfield, Utah, artificial cryolite plant (*CW*, *Feb*. 22, *p*. 34). Production target for this year: 1,600-1,800 tons. The cryolite (sodium aluminate fluoride) will go to the Pacific Northwest aluminum industry, and into agricultural insecticides to be made at the Garfield plant. Heckathorn will also make sodium fluorides and ammonium bi-fluoride. The firm is moving its Texas City plant to Garfield.

FOREIGN

Synthetic Rubber and Fertilizer/Italy: The government's Azienda Nazionale Idrogenazione Combustible plans to export to the U.S. GR-S rubber from its 35,000-tons/year Ravenna plant (CW, March 1, p. 20). The rubber—trademarked Europrene—is priced at 25-28¢/lb. f.o.b. Ravenna. Market prices for the plant's nitrogen fertilizer output (slated to hit 650,000 tons/year in '59) have not been set, although 70,000 tons have already been sold abroad. Output will be aimed at the Middle East and Far East.

Caffeine/India: Government-owned Unichem Laboratories will start making caffeine through a new, \$210,000 subsidiary. It will be India's first caffeine plant. Production will start at the rate of 1,200 lbs./month, will be trebled within six months. The firm also plans to produce liver extract, crude drug extract from nux vomica, and related products.

Perlite Filter-Aids/Mexico: Great Lakes Carbon Corp. (Los Angeles) has opened a 6,000-tons/year Perlite filter-aid plant in Mexico City, and is enlarging an experimental plant at Socorro. In June, production will start at latter plant, for sale in the U.S.

Chemicals/China: Red China is stepping up its chemical industry on several fronts:

- A 20,000-tons/year artificial wool plant in Antung, Manchuria, and a 500-tons/year rayon plant in Shanghai started production this month. They're forerunners of seven chemical fiber plants to be built in Shanghai by '62 with a total capacity of about 100,000 bales. Fibers will include Terylene, artificial silk, kaprone, acetate and nylon-66.
- A 10,000-tons/year potassium-nitrogen fertilizer plant has started up in Nanking. Plans call for building a 48,000-tons/year ammonium bicarbonate pilot plant in Peking.
- Other projects: a synthetic rubber-from-alcohol plant abuilding in Lanchow, a resins plant just onstream up in Shanghai, and a 1.6-3.5-million-tons/year salt field under development near Taku.

from General Mills...

New liquid epoxy co-reactants

For:
Coatings
Casting
Potting
Adhesives
Laminates

Genamid 250 and 310 are new fluid resinous amine adducts developed to satisfy the needs of the formulator. They are the latest products of General Mills continuous research in improved epoxy-reactive polymers.

These low viscosity co-reactants provide easy blending with fluid epoxy resins. In addition, higher filler ratios can be used to reduce formulation costs. Genamid 250 and 310 are especially designed for coatings, adhesives, casting, potting, laminates and other applications where their specific properties offer outstanding advantages.

GENAMIDS give you these advantages:

LOW VISCOSITY—Genamids blend easily with fluid epoxy resins, permit higher filler ratios, have good wetting properties to simplify preparation of formulas.

POT LIFE—Blends of Genamid and epoxy have 50-75 minute pot life at room temperature with low exotherm—can be used economically for bulk casting.

Genamid and epoxy cure to near optimum properties in 6 to 8 hours; to maximum properties within 24 hours. At elevated temperatures, complete cure can be achieved under 15 minutes.

COMPATIBILITY—Genamids are compatible with a wide range of fluid epoxy resins. Optimum properties result from a ratio of 30 parts of Genamid co-reactant and 70 parts of fluid epoxy resin.



	GENAMID					
Specifications:*	250	310				
Amine Value	425-450	380-415				
Viscosity at 25°C—Poises	5-10	40-60				
Color—Gardner*Tentative	NDT-11	NDT-12				
Typical Properties (Average)						
% Ash	0.2	0.2				
Specific Gravity	0.95	0.96				
Pounds per Gallon	7.9	8.0				

GET MORE FACTS, EVALUATION SAMPLE
Write Chemical Division General Mills, Dept. CW-5

Genamids are available in commercial quantities and are shipped from our mid-continent location in Kankakee, Illinois

District Offices: New York, 156 William Street Chicago, 460 South N.W. Highway, Park Ridge, III.

CHEMICAL DIVISION

Kankakee, Illinois

General Mills

THERE'S GOOD NEWS TODAY...

Many

to

"new

ere also

e called

ational. à dinner

Philadelphia, Pennsylvania-Work was recently completed on two 26,000 B/SD Platforming® units at Gulf Oil Corporation's Philadelphia refinery by Procon Incorporated, Two 26,000 B/SD Hydrobon® units used with the Platformers were also built by Procon. The Platformer heaters were the largest ever built. Procon engineers recommended single heaters for each Platforming unit instead of two smaller heaters for best use of available space and maximum construction economy.

Al Kuwait, Kuwait-Work is proceeding on 4,000 B/SD Platforming-Unifining* units and a 7,200 B/SD prefractionator being built by Procon (Great Britain) Limited for Kuwait Oil Company at Kuwait on the Persian Gulf. Work covers mechanical and structural design, engineering, procurement, inspection and supervisory services for Kuwait.

Bakersfield, California-The construction of Mohawk Petroleum Corporation's 925 B/SD Unifining unit was recently completed by Procon Incorporated. This unit processes thermally cracked naphtha derived from California crude. The Unifining unit was built at Mohawk's Bakersfield, California, refinery.

at PROCON open at all times to must be vigilance a exploitation "by

> London, Ontario, Canada Procon (Canada) Limited recently completed the installation of flaking mills, ovens, conveyors, dust collection systems and related equipment as part of a plant modernization program for Kellogg Company of Canada, Ltd. This construction covered improvements to Kellogg's cereal processing plant at London, Ontario.

said,

their minds of

against what

must be vigi

Royal Scientific and preceding opening

Heide, Germany-Construction was recently completed on a 4,000 B/SD Platforming unit under the supervision of Procon (Great Britain) Limited for Deutsche Erdol-Aktiengesellschaft (DEA). This is part of an extensive reconstruction program, and will supply premium gasoline to Northern Germany and Denmark.

Those authorities consider

Procon service is available to the oil refining, petrochemical and chemical industries, anywhere in the world. New plant construction, expansion or modernization, whatever the requirement, Procon will do it right, and on time.

*Trademark

PROCON Incorporated

1111 MT. PROSPECT ROAD, DES PLAINES, ILLINOIS, U. S. A.

PROCON (CANADA) LIMITED, TORONTO 18, ONTARIO, CANADA

PROCON (GREAT BRITAIN) LIMITED, LONDON., W. C. 2. ENGLAND PROCON INTERNATIONAL S. A., SANTIAGO DE CUBA

WORLD WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

Washington

Newsletter

CHEMICAL WEEK May 24, 1958 Congressional battle over reciprocal trade calmed down only temporarily last week when House Ways & Means Committee voted two amendments that could open for domestic producers new paths to import restrictions. One would give Congress a say in Presidential decisions on Tariff Commission escape-clause recommendations by subjecting a White House rejection of higher tariffs and quotas to a two-thirds veto by both houses of Congress. The other would require Office of Defense Mobilization to start hearings on pleas for trade restrictions, on grounds of national security, without awaiting White House instructions, and also broaden the existing defense-essentiality amendment to permit looser interpretation.

Russia may become a big market for Western chemical plants and chemical process equipment as a result of the ambitious expansion program for the Russian chemical industry announced by Nikita Khrushchev.

Khrushchev called for expenditure of 100 billion rubles (\$25 billion at the official rate of exchange) between now and '65 for expansion of the chemical and synthetic fiber industries. He said that would mean expanding production of artificial and synthetic fibers 4.6 times, production of plastics and synthetics 8 times, production of synthetic rubber 3.4 times. Production of ammonia, caustic soda, soda ash, sulfuric acid and tires would be doubled. To do that, Khrushchev plans to build 257 new chemical plants by '65.

An important part of the new equipment needed—largely in the form of complete plants—would be sought in the U.S., Britain, and Western Germany. The Russians undoubtedly will concentrate on buying prototype plants from the West for copying in the Soviet Union.

Moscow has already called for Western bids on 16 chemical plants of various types with a total estimated value of about \$100 million as a first installment. Russian purchasing agents indicate that more orders will be forthcoming if the first deals work out satisfactorily.

U.S. controls on exports to the Soviet Union on the whole are more strictly applied than are Western European controls. Commerce Dept. won't commit itself on whether it would grant export licenses for the chemical plants the Soviets are seeking. Commerce is sure to look closely at any applications for export licenses in view of the ease with which many chemical plants can be adapted to military uses.

Congressional Democrats renewed their row with Administration this week over federal grants to help build municipal sewage-treatment plants. Chairman John Blatnik (D., Minn.) slated three days of public

Washington

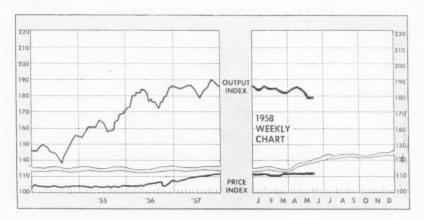
Newsletter

(Continued)

hearings May 20-21-22 on his bill to double the present 10-year authorization of \$500 million in such grants. Blatnik is pushing for a \$1-billion federal contribution, but he's under pressure from American Municipal Assn., representing U.S. mayors, to up the total to \$1.5 billion.

Chemical and other industry spokesmen who testified on the new federal stream pollution control program two years ago, when Blatnik's bill was launched, have been invited to appear before the subcommittee, but are likely to maintain their hands-off position. Most industrial pollution doesn't show up in municipal water supplies—although in cases where it is a factor, such as Kansas City, industrial polluters are contributing to the municipality's costs of undertaking new treatment works construction ordered by U.S. Public Health Service.

The hearings anticipate by less than a week the annual Governors' Conference at Miami. The Administration plans to go to the conference with a plan for cutting off federal construction grants for sewage works in mid-'60 and have the states take on the financial assistance job, instead. The White House is ready to sweeten the pill by asking Congress to turn over to the states part of the federal government's telephone tax revenues, enough to maintain the existing rate of grants without tapping existing state revenues. But the governors will take a harder look at such a deal if Congress expands sewage construction grants to the cities between now and the mid-'60's. The states would have a heavier financial burden to bear—if they take over this program.



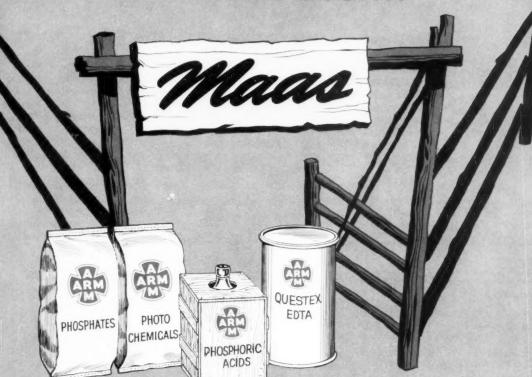
Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	179.5	179.0	184.0
Chemical Week wholesale price index (1947=100) Stock price index of 11 chemical companies	111.0	111.0	110.0
(Standard & Poor's Corn.)	38.70	39.52	45.49

		Exports			Imports	
MONTHLY Foreign Trade (million dollars)	Latest	Preceding Month	Year Ago	Latest	Preceding Month	Year Ago
Chemicals, total	106.8	104.2	99.1	22.7	22.0	23.2
Coal-tar products	8.5	7.3	5.4	5.3	4.3	5.1
Industrial chemicals	18.7	16.2	17.8	5.8	6.9	7.0

Our corrals are right next door...





Western buyers need less warehouse space, save capital when they depend on fast deliveries from their next door neighbor. Fast mixed carload and truckload deliveries from our plants on such chemicals as:

M S P
D S P
T S P
T S P
T S P
S A P P
DRI-TRI (TSP ANHY.)
ARMOFOS (TRI-POLY)
VITRAFOS (GLASSY)
CHLORINATED TSP

POTASSIUM PHOSPHATES PHOSPHORIC ACIDS SODIUM CARBONATE SODIUM HYPOSULFITE ANHYDROUS HYPO SODIUM SULFITE ACETIC ACID QUESTEX (EDTA)



A. R. MAAS CHEMICAL CO. Division of Victor Chemical Works

General Offices: South Gate, California Plants: Richmond and South Gate, California

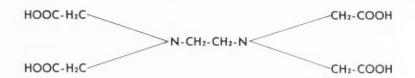


Turn Page for QUESTEX (EDTA) facts





QUESTEX° EDTA FACTS



ETHYLENEDIAMINE TETRA-ACETIC ACID AND DERIVATIVES

QUESTEX is recommended where heat and time stable, soluble metal complexes are beneficial; where deterioration from trace metals must be avoided and where scale and sludge must be prevented or removed. QUESTEX (EDTA) chelants have changed the whole water chemistry of such ions as calcium, magnesium, copper and iron, and offer a new approach to problems in detergency, polymerization, chemical processing and product stabilization.

At suitable pH Bi and trivalent cations are so firmly bound within the QUESTEX structure that for all practical purposes they are completely removed from solution. Preferential chelation is also possible as metallic cations with high stability constants such as Fe+++ will form complexes before metals with lower stabilities such as Cu++ or Ca++. In some systems selective impurity precipitation can be accomplished by simple pH adjustment.

To help you select the QUESTEX chelant most suitable for your purpose we offer the following table of properties:

QUESTEX®	4H EDTA Acid ANHYDROUS	4SW 4-Sodium Salt 4H ₂ O Crystal	4S 4-Sodium Salt Anhydrous	2SW 2-SODIUM SALT 2H,0 CRYSTAL
Molecular Weight	292.25	452.25	380.20	372.20
Typical Assay	99.5%	100.3%	96.5%	100.0%
EDTA 4H Equivalent	99.5%	64.8%	74.2%	78.5%
Practical Solubility 25°C to 90°C — grams per 100g added H ₂ O	0.1·0.4 g.	51-63.5 g.	44-54 g.	6-20 g.
Milligrams CaCo ₃ chelated per gram at pH 8.	340 mg.	220 mg.	255 mg.	270 mg.
Quantity to chelate one pound CaCo ₃	2.94 lb.	4.55 lb.	3.92 lb.	3.73 lb.

Unlike water treatments used in the past, QUESTEX offers an economic advantage in some processes where recovery and recycling make it possible to use the chelant over and over again. Effectiveness of cleaning compounds is usually enhanced when QUESTEX is combined with phosphates. The values of wetting agents and sanitizers, such as quaternary ammoniums, are greatly increased by QUESTEX additions.

Many users of EDTA find the uniformly high assay of QUESTEX offers greater economy. If you do not yet use EDTA chelants, you'll find it worth while to investigate these interesting and versatile new chemicals.

More information is available on request. Let's discuss your application — we'll be glad to work with you.

"Phosfacts-Ortho" and "Phosfacts-Poly" data sheets on sodium phosphates are also yours for the asking.



A. R. MAAS CHEMICAL CO. Division of Victor Chemical Works

General Offices: South Gate, California Plants: Richmond and South Gate, California



PRODUCTION

"We have a union contract that prevents us from closing down the plant for vacations."

"Our process makes a vacation shutdown uneconomical."

"Closing the plant for vacations gives our maintenance crews a chance to work unhampered." "Because of poor sales we had to close for a few weeks earlier this year. Operators took their vacations then."

"We tried to shut down, but it upset our employee relations."

"Operators are required during shutdown periods as much as when the plant is running."

Weighing Wisdom of Vacation Shutdown

The recession may be forcing some manufacturing plants to schedule employee vacations during temporary plant shutdowns, but most chemical process plants surveyed this week by CW are not changing this year's vacation policies.

A few plants shut down earlier this year because of poor sales and rising inventories and asked plant personnel to take the first two weeks of shutdown as their annual vacation. But most chemical firms do not favor vacation shutdowns. Typical quotes (above) tell why.

The reason most often given for not interrupting operations during the summer: chemical plants generally don't lend themselves to shutdowns. Continuous or semicontinuous processes make shutdowns and startups complex and costly (e.g., balancing distillation columns, cooling and heating furnaces). As Victor Chemical points out, shutdowns are handled most economically upit by unit, shouldn't be indulged in *en masse*.

And this applies to facilities other than process equipment. Many firms, Dow Chemical for one, operate their own steam and electric generating stations. These facilities function most efficiently on a continuous basis under peak or near-peak loads.

Dow notes that most installations involve large capital investments, can't

afford to be idle. Amoco Chemical stresses the loss of production through shutting down high-capacity continuous units. But most firms concede that if production must be curtailed because of business conditions the ideal time to shut down for maintenance is during the summer months, when out-of-doors repair jobs can be more easily performed.

Batching: Batch operations, however, are often shut down during the summer. Stepan Chemical, for example, plans to stop operating for two weeks, take care of major maintenance. A skeleton crew will remain to handle emergencies and special customer demands. Another firm that shuts down its batch plants makes the same line of products at each plant; by staggering schedules, at least one of its plants can always handle a rush order.

But many firms say their maintenance requirements can be adequately fulfilled while the plants are operating. And when shutdowns are necessary, they are usually not long enough to permit vacations. International Minerals & Chemical, for example, shuts down certain units for one day every two or three weeks.

National Petro-Chemicals Corp. says its operators often have more work to do during a shutdown than when the plant is operating. Operators inspect equipment, must answer maintenance department questions as to what lines might be dangerous to repair (because lines are under pressure, contain product, etc.).

Personnel Problems: Trubek Labs'. Truland Chemical Division's shutdown problem is typical of the situation in many small plants. Unless it schedules a vacation shutdown, it must find replacements for vacationing operators. In large companies, the problem is less acute. Most firms insist that individual vacation schedules do not conflict. If a conflict exists, seniority settles the issue.

One large refinery with a tight union contract must keep a certain number of men on each job throughout the year. It employs a versatile "vacation group," whose only job is to substitute for others on vacation. Another plant's contract with the union prohibits closing down the plant for vacations.

Several firms report that their plants tried closing down for vacations a few years ago, wound up with rough industrial relations problems—employees did not want to be told by management when they had to take their vacations.

Some firms restrict vacations to a six- or eight-month period of the year, but make no hard-and-fast rule. In some resort-area plants (CW, Sept.

SODIUM BICARBONATE, U.S.P.

Specialized Grain Sizes

MONOHYDRATE of SODA

CON SAL

CONCENTRATED CARBONATE
OF SODA CRYSTALS

Technical Service

CHURCH & DWIGHT CO., Inc.

70 Pine Street N

New York 5, N.Y.

Phone Digby 4-2181

CROLL-REYNOLDS Jet-Venturi Fume Scrubbers minimize odors

clean and purify air
and other gases
without fan or blower

ADDITIONAL APPLICATIONS

to recover valuable solids use as Jet Reactors

SEND TODAY FOR COMPLETE CATALOG



Croll-Reynolds 00, 100

Main Office: 751 Central Avenue, Westfleld, N. J

New York Office: 17 John Street, N. Y. 38, N. Y.
CHILL VACTORS * STEAM-JET EVACTORS * AQUA VACTORS * FUME SCRUBBERS * SPECIAL JET APPARATUS

PRODUCTION

7, '57, p. 27), employees prefer to take vacations at special times of the year—e.g., during the duck or deer hunting seasons. At one Midwestern plant, entire units were shut down during the deer season. But plant policy changed a few years ago with the switch from batch to continuous processing. Operators may still take vacations during deer season, but substitute operators keep units running.

Titanium Under Glass

A water-soluble glass coating for protecting titanium from contamination during heat treatment is Boeing Airplane Co.'s (Seattle) new contribution toward lowering fabrication costs.

The coating—described by Boeing as a soda-boron-aluminate glass with formaldehyde-resin binder and a suspension agent in an alcohol vehicle—is sprayed onto 6Al-4V alloy. In 15 minutes, it dries to a glossy black. Then the titanium sheet is heattreated in an air furnace at 1700 F. The coating spalls off when quenched because of the difference in coefficient of expansion between it and titanium.

A barrier-type coating, it remains on the metal's surface, causes only faint metal discoloration. And it prevents air contamination that causes embrittlement, scaling of the titanium.

Boeing used an aluminum-silicone paint in its old coating method, gave each titanium sheet four spray coats. This required baking at 1200 F for 4-6 hours. Total coating time: about 30 hours. And, after heat-treating and quenching, the coating had to be removed by alkaline softening, then hydrofluoric acid pickling.

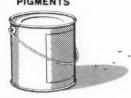
Boeing is now making sufficient coating for its own needs. But if titanium use increases, a manufacturer would be licensed to fill orders.

EQUIPMENT

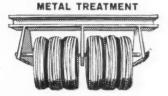
Glassed-Lined Drier: Glascote Products, Inc. (Cleveland), subsidiary of A. O. Smith Corp., is out with a glass-lined conical rotary drier-blender for a broad range of corrosive or heat-sensitive materials. Designed for drying crystalline chemicals and polymers containing water, organic or inorganic chemicals, the drier-blender is available with either acid- or acid-



CORROSION CONTROL



WOOD PRESERVATION



TEXTILE DYEING





for these and other uses

MUTUAL SODIUM BICHROMATE

comes in grades and packages to fit your requirements

GRADES	Technical Granular	Technical Solution	Reagent Granular
Na ₂ Cr ₂ O ₇ •2H ₂ O (Min.)	99.8%	69.0-69.2%	99.9%
Chloride as CI (Max.)	0.06%	0.3%	0.005%
Sulfate as SO ₄ (Max.)	0.2%	0.4%	0.007%
Vanadium as V (Max.)	0.005%	0.02%	0.002%
PROPERTIES			
Crystal system	monoclin	ic, sphenoidal	1
Stability in air	deliquesc	es in humid a	ir
Behavior on heating	salt melt	o anhydrous (s @ 356.7°C se around 400	, starts to
Density	2.348 @	25°C	
Heat of solution	minus 28	.2 cal/gram	
Transition in solution	84.6°C to	anhydrous	
Eutectic with water	minus 48	.2°C	
Eutectic composition	69.0% Na	2Cr2O7 • 2H2O	
Bulk weight	96 lb/cu	ft	

However you apply the properties of this chemical of many uses, Mutual Sodium Bichromate is available in forms, grades and packages to meet your requirements. It is produced in both technical and reagent grades, the former in both granular and solution form. Technical solution is shipped in tank cars and tank trucks. Technical granular is packaged in 100-lb. net paper bags, 400-lb. net fiber drums and both 100 and 400-lb. net steel drums; reagent granular, both 100-lb. net and 400-lb. net steel drums.

Buyers of Mutual brand, in addition to being guaranteed highest quality, are assured of expert technical assistance and within 24-hour shipping service when needed.

For all the facts, mail the coupon today.

IF YOU USE CHROMIUM CHEMICALS, YOU CAN USE THIS BROCHURE

Mutual chromium chemicals

Sodium Bichromate Sodium Chromate Chromic Acid Potassium Bichromate
Potassium Chromate
Ammonium Bichromate

SOLVAY PROCESS DIVISION 61 Broadway, New York 6, N. Y.



MUTUAL chromium chemicals are available through dealers and SOLVAY branch offices located in major centers from coast to coast.

Alkar

A new non-corrosive process for the efficient and economical conversion of normal butane to iso-butane

Butamer, now being made available to refiners by Universal Oil Products Company, will help meet the increasing demand for iso-butane.

Development by UOP of a special platinum-containing catalyst permits the efficient production of iso-butane especially as feed for alkylation processes.

Minimum initial investment for Butamer installations is achieved as its flexible design permits economical integration with alkylation units.

Mild operating conditions are used in the Butamer process resulting in little loss to by-products.

Butamer is one of many UOP petrochemical and refining processes available to refiners everywhere. We will be glad to provide full information on this or any other UOP process without obligation.



UNIVERSAL OIL PRODUCTS COMPANY

30 Algonquin Road, Des Plaines, Illinois, U.S.A. More Than Forty Years Of Leadership In Petroleum Refining Technology

New UOP Petrochemical and Petroleum Processes Now Available To Refiners

Two new processes, Alkar and Butamer, recently announced by Universal Oil Products Company, offer a great potential for helping refiners secure maximum profits from their operations. Alkar provides the refining industry with a practical means of enjoying the increasing market for petrochemicals with minimum capital investment and profitable operational ratios. Butamer offers the refiner an economical method of securing isobutane.

The Alkar process permits the utilization of the light olefin content of fuel gas on a much larger scale than has previously been practical for the average refiner. The recovery of this by-product olefin from off-gas streams has been frequently impractical because of the very substantial investments necessary for separation equipment. In the development of the Alkar process, UOP worked on the premise that great economies would result if the byproduct olefin could be chemically converted without the necessity of prior concentration. The accomplishment of this with the Alkar process now makes it possible for many more refiners to enter the petrochemical field.

The Alkar process is based on the use of a completely new catalyst. This catalyst, in solid form, is used as a fixed bed in reactors of conventional design. The catalyst being non-corrosive, the use of expensive alloys in reactor construction is unnecessary. It is stable against conditions normally encountered in processing and in the handling required in loading the reactors. Catalyst costs are low and special catalyst handling equipment requirements are at a minimum.

Another potential application of the Alkar process provides for the upgrading of fuel gas value olefins to premium octane motor fuel. This is accomplished by the use of the Alkar process to react the olefins with aromatics produced by catalytic reforming.

The Alkar process is but one of a number of petrochemical processes UOP makes available to the refining industry. For many years UOP's research and engineering staffs have been actively developing processes

Alkar and Butamer processes increase refining profits with minimum investment

which yield valuable chemicals from petroleum raw materials and refinery by-products. To provide a broad range of processes for a refiner's every need, Universal also licenses several processes originated by others. UOP petrochemical processes available to refiners include . . . Catalytic Condensation . . Olefin Extraction For Butylene Recovery . . Catalytic Dehydrogenation . . . Hydrar* . . . Udex® (originated by Dow Chemical Company) . . . Two-Stage Unifining* . . . Arosorb* (originated by Sun Oil Company).

The Butamer Process

The Butamer process fills the need for an efficient and economical method for converting normal butane to isobutane. This process is particularly important at this time because of the growing demand for isobutane resulting from the increasing use of alkylate for blending into motor fuels.

This process is the result of extensive UOP research and development to secure an improved normal butane isomerization technique. The accomplishment makes it possible for refiners to have, at minimum capital investment, a practical and profitable means for normal butane isomerization.

The basis of this process is the development of a stable and rugged catalyst, capable of operating at relatively low temperatures. Low temperature operation is essential so that the concentration of isobutane in the effluent from the reactor will be sufficiently high to eliminate excessive recycle of normal butane.

Data obtained with the platinum-containing Butamer catalyst show that temperatures in the range of 600° F. to 850° F, will produce an equilibrium concentration of isobutane in the total butane effluent ranging from 49% to 40%. The process is operated under hydrogen pressure.

A low hydrogen-to-charge ratio is used. The high activity of the catalyst makes it possible to operate the process at economical liquid hourly space velocities. This makes possible a reasonable catalyst inventory.

UOP will be glad to supply, without obligation, individual recommendations for the practical application of its various petrochemical processes to any refining operation, anywhere in the free world.

This makes possible a reasonable catalyst inventory.

UOP will be glad to supply, without obligation, individual recommendations

A new process for the economical and efficient upgrading of fuelgas olefins to high value alkylaromatics

Alkar, now being made available to refiners by Universal Oil Products Company, provides the first economical means for the efficient use of ethylene without costly prior separation.

Diversification of refinery products is attained by use of this process through channeling a portion of total output into the important new markets created by the growing demand for petrochemicals.

The favorable economics of Alkar processing allow application of this technique in all sizes of refineries, thus permitting entry of new operators into the petrochemical field.

Alkar is one of many UOP petrochemical and refining processes available to refiners everywhere. We will be glad to provide full information on this or any other UOP process without obligation.



Butamer

Trademark



UNIVERSAL OIL PRODUCTS COMPANY

30 Algonquin Road, Des Plaines, Illinois, U.S.A. More Than Forty Years Of Leadership In Petroleum Refining Technology

*Trademark



• These are a few of the characteristics and possible uses of Nalcamines that may give you profitable ideas for their application to your products:

- Cationic surface-active agents

 —can be made either water- or
 oil-soluble.
 - -Wetting agents.
 - -Foaming agents.
 - -Emulsifiers and demulsifiers.
 - -Anti-corrosion agents.
 - -Anti-static agents.
- React on an equimolar basis to form salts.
 - -Adjustable oil and water solubility.
 - -Excellent stability at low pH.
- Selectively adsorbed on many different surfaces in both oil and water systems.
 - -Improve asphalt coatings; better resistance to water stripping.
 - -Change water accepting surfaces to water repelling surfaces.
 - -Provide dispersion and lubricity in rubber, plastics, asphalt.

 Improve paint bonding and
 - water repellancy.

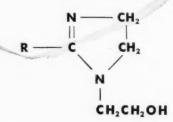
 —Increase efficiency of flotation

processes.

☐ IF you want wetting, dispersion, foaming or emulsification as "built-in" characteristics of your products, check with Nalco on the suitability of Nalcamines to do the job.

NALCAMINES are of the imidazoline (glyoxalidine) class of cyclic tertiary amines, now being manufactured with controlled purity and uniformity for practical commercial use.

TYPICAL Nalcamine structure where R is a long hydrocarbon chain.



Now the exciting possibilities of cyclic tertiary amines are practical for adaptation into commercial products with the use of Nalcamines. Control of purity and uniformity, combined with practical pricing, put the Nalcamines solidly into the class of economically-sound working chemicals.

Write today for complete data and prices. Laboratory samples or tank car lots are available promptly.

NATIONAL ALUMINATE CORPORATION

6185 West 66th Place Chicago 38, Illinois
Telephone: POrtsmouth 7-7240
CANADA: Alchem Limited, Burlington, Ontario
NORTHWESTERN UNITED STATES, HAWAII and ALASKA
The Flox Company, Inc., Minneapolis 3, Minnesota
ITALY: Nalco Italiana, S.p.A.
WEST GERMANY: Deutsche Nalco-Chemie GmbH
SPAIN: Nalco Espanalo, S.A.



Serving Industry Through Practical Applied Science

PRODUCTION

alkali-resistant glass linings, will handle materials (except hydrofluoric acid) up to pH 12 at 210 F. Standard sizes are 5-35 cu.ft., with capacities up to 255 cu.ft. available on special order.

Plastic Valve Operator: An allplastic molded valve operator is now offered by Chemtrol, division of Tapered Air Products (Lynwood, Calif.). The equipment weighs approximately one-tenth, costs just a fraction as much as its metal counterpart. It is resistant to electrolysis, corrosion or erosion, both internally and externally, is constructed to withstand temperatures up to 300 F. Plastics available: PVC, Kralastic, Penton, Profax.

Valve Operation Converter: C. H. Wheeler Mfg. Co. (Philadelphia) is offering Valvmatic, a unit for converting installed valves from hand to electric operation. Applicable in nearly every case where the valve handle does not rise, Valvmatic can be installed directly on existing valves without special tools or engineering.

Air-Handling System: A major design change in its CM-203 Pneu-Pac air-handling system is announced by Sprout, Waldron & Co. (Muncy, Pa.). Substitution of a 16x14-in. airlock-manifold combination in place of the 14x20½-in. blow-through airlock feeder, resulted in a simpler and more trouble-free unit, says the company. It claims there is less likelihood of coarse or granular products becoming wedged between the rotor periphery and the inside of the housing or between the ends of the rotor and the inside surface of the housing ends.

High-Pressure Valves: Air Reduction Sales Co., division of Air Reduction Co. (New York), is offering a new line of forged brass high-pressure valves. Now available are ½-in. and ¾-in. sizes in the master-valve category (3,000 psi.); 1-in. and ½-in. sizes of the nonreturn shutoff type (250 psi.); and a 1-in. size of the pneumatic electric type (150 psi.).

Gasketing Material: A new rubberasbestos material called Kaobestos is being introduced by F. D. Farnam Co. (Chicago). A highly uniform material, it is said to offer lower costs than conventional gasketing materials



URETHANE INTERMEDIATES

GIVE YOU BETTER CONTROL OF POLYMER PROPERTIES

New polyethers available in commercial quantities

The commercial availability of a host of new urethane polymer intermediates gives you an opportunity to pick the right combination of molecular weight and functionality. The choice of product properties offered by diol polyethers and triol polyethers permits new and improved formulations for flexible foams, semi-rigid and rigid foams, elastomers, coatings, and adhesives.

SPECIAL RESIN GRADE DIOLS

Polypropylene glycols are widely used as major components in polyether systems. Three new grades are available in tank car quantities:

	Pro	duct		Molecular Weight			dro	
NIAX	Diol	PPG-2025	2025.				 . 56	
		PPG-1025						
		DDC 425						

The range of molecular weight permits a wide variation in polymer properties, Niax Diol PPG-2025 is incorporated in cushioning products. Niax Diol PPG-1025 and Niax Diol PPG-425 are of value in semi-rigid foams, coatings, and elastomers.

6 TRIOLS IN NEW SERIES

A new series of Niax polyurethane intermediates are the propylene oxide adducts of trifunctional polvols-

	Prod	uct		xyl er*		olecula Weight
NIAX	Triol	LHT-42	 42.		 	4.000
NIAX	Triol	LG-56	 56.		 	3,000
		LHT-67				
		LHT-112				
NIAX	Triol	LG-168	 .168.		 	1,000
NIAX	Triol	LHT-240	 .240.		 	700

Polyethers with three reactive hydroxyl groups are used to obtain highly crosslinked urethane polymers. In general, as the hydroxyl number of NIAX Triol increases, so does the load-bearing properties of the final foam, NIAX Triol LHT-42 gives a very soft flexible foam, while NIAX Triol LHT-240 is useful in formulating semi-rigid crash pads.

Flexible foams made with NIAX Triol LHT-67, NIAX Triol LG-56, and NIAX Triol LHT-112 show improved compression set characteristics over similar foams based on diols cross-linked with low molecular weight trifunctional or tetrafunctional simple polvols. NIAX Triol LHT-112 and Niax Triol LG-168 with Niax Diol PPG-2025 in flexible foam formulations give improved compressiondeflection properties with minimum loss in tensile strength or resiliency.



new field of polymer chemistry has developed through study of the reaction of the isocyanate group with compounds containing active hydrogen atoms. Development of new low-cost polyethers is speeding the commercial use of urethane polymers—from soft resilient foams pictured here to semi-rigid crash pads and tough abrasion resistant elastomers and coatings. The Carbide polyethers—through the hydroxyl group—react with aromatic disocyanates in the presence of amine catalysts to form the stable urethane

Thus, foam properties can be varied over a wide range by use of the NIAX Triols alone or in combination with NIAX Diols

MIXED OXIDE DIOLS

In addition to the straight polyoxypropylene ethers, copolymers of ethylene oxide and propylene oxide are now available for evaluation. Polyethers containing 10, 25, and 50 per cent polyoxyethylene linkages suggest numerous applications where good low temperature properties and reduced oil solubility are needed. The copolymers containing higher amounts-25 and 50 per cent-of ethylene oxide are suggested for trial in sponges and other products where water absorption is needed.

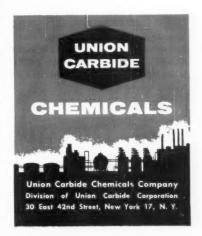
HIGH QUALITY

All of the Niax polyethers are produced to rigid specifications that assure you of uniform quality of the prepolymers and final product. Specifications for NIAX intermediates are available from your CARBIDE Technical Representative - or write . . . Department H, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, New York. In Canada, Carbide Chemicals Company,

Division of Union Carbide Canada Limited, Montreal.

*Hydroxyl number is defined as the number of milligrams of KOH equivalent to the hydroxyl content of one gram of NIAX polyether sample.

"Niax" and "Union Carbide" are registered trade marks of Union Carbide Corporation.





FOR PROMPT SHIPMENT ... TANK CAR OR DRUM specify Blockson

HYDROFLUORIC ACID

Blockson's large production, extra standby capacity and plant-expansion program protect your HF source. Tank cars shipped direct from Joliet. Drums direct or from nearest Blockson distributor. Call Joliet 2-6601, collect.

OTHER BLOCKSON CHEMICALS:

Sodium Tripolyphosphate • Tetrasodium Pyrophosphate • Trisodium Phosphate (Crystalline-Monohydrate) • Trisodium Phosphate Chlorinated • Disodium Phosphate (Crystalline-Anhydrous) • Monosodium Phosphate (Anhydrous-Monohydrate) • Sodium Polyphos (Sodium Hexametaphosphate-Sodium Tetraphosphate) • Sodium Acid Pyrophosphate • Tetrapotassium Pyrophosphate • Sodium Fluoride • Sodium Silicofluoride • C-29 Sequestering Agent • Teox 120 (Nonionic Surfactant) • Sulfuric Acid.



BLOCKSON CHEMICAL COMPANY
Division of Olin Mathieson Chemical Corporation
JOLIET, ILLINOIS

PRODUCTION

for such applications as heat exchangers, compressors, diesel engines.

Heat Transfer Pipe: Bi-Metal Thermek is a new extended-surface tubular product of high heat transfer capacity offered by Heatron, Inc. (York, Pa.). The firm says Bi-Metal Thermek provides the corrosion resistance of stainless steel, but is lighter, has greater heat conductivity and costs less than a corresponding unit made wholly of stainless steel. The inner surface consists of a 5/8-in. (OD.), 18-gauge stainless steel tube; the outer surface, pressure-bonded to the stainless tube, is a 1/2-in. SPS aluminum pipe, spined for maximum integral surface for greatest heat transfer per lineal inch.

Plastic Pumps: Three new plastic sealless pumps designed especially for equipment manufacturers are being introduced by Vanton Pump & Equipment Corp. (Hillside, N.J.). All are self-priming, use interchangeable component construction materials. Model CC is a close-coupled pumpto-motor unit designed for use with corrosive fluids, abrasive slurries and viscous materials. The motor is rated at 1/4 hp., and the unit may be used for stationary or portable service. Model FM (face-mounted) features compactness, is designed to operate with equipment that already includes power take-off. Model PM (pedestal-mounted) is furnished for direct connection to a motor device.

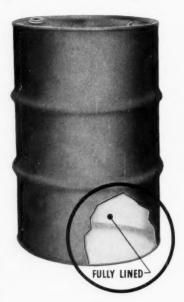
Smokeless Flare: Esso Research and Engineering Co. (New York) has developed a new refinery safety flare that burns with a smokeless, invisible flame. The flare's chief application will be in new refineries. But Esso Standard Oil Co. is studying its use in existing refineries as an aid to present air-pollution control campaigns (CW, May 10, p. 47).

The flare has a psychological advantage, too. The gas is burned in the base of a 38-ft. stack rather than in the open. Absence of a visible flame will prevent misinterpretation of the flaring operation by outsiders as dangerous, wasteful.

In the new design, flared gases ejected from multijet burners impinge against solid-rod refractories to pick up extra air before they reach the ignition zone.

CUT COSTS 25%

An important factor in the cost of many liquid chemicals is the cost of shipping containers. Use of Binder *Rebuilt*, Lined, Bung-Type Drums will cut that cost by 25%.



BINDER Rebuilt Drums

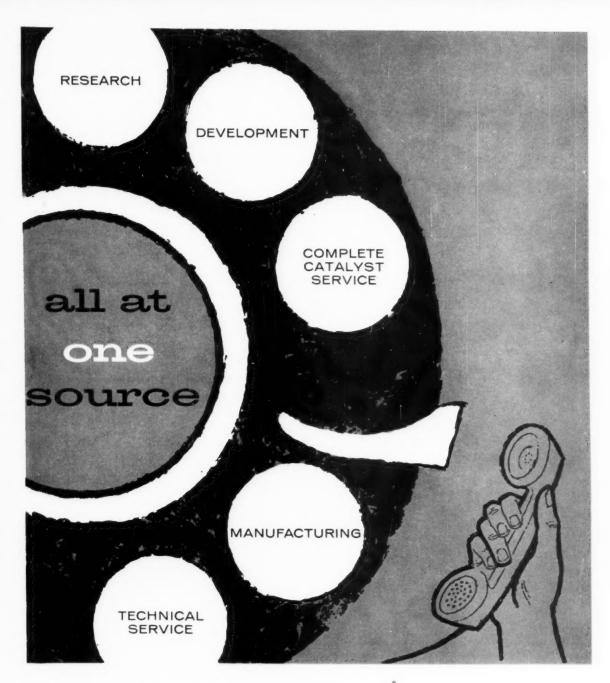
- √ are dependable
- 1/ are chemical-resistant
- √ can be furnished lined to your specifications with any approved lining
- √ are bung-type
- √ have been proven in service by major chemical producers

Ask us about these economical, guaranteed drums.



BINDER COOPERAGE CO.

N. W. Cor. Delaware Ave. and Dickinson St. Philadelphia 47, Pa.



Houdry Process Corporation offers the chemical, pharmaceutical and petrochemical industries complete catalyst service, plus years of experience in catalytic processing. Houdry is the "one source" best qualified in every way to design, develop and produce the right catalyst for highest process efficiency and profits.

Among the Houdry catalysts available are *Platinum* and *Palladium Catalysts* on charcoal or alumina for hydrogenation and dehydrogenation . . . *Chromium Oxide Catalysts* for dehydrogenation . . . a series of *Aluminas* and *Silica-Aluminas* for catalyst bases . . . special-purpose catalysts tailored to individual processes.

You may find it profitable to write us outlining your needs.



*Houdry means Progress . . . through Catalysis



Caustic soda and white reinforcing pigments, basic Columbia-Southern chemicals, are used throughout many industries. World's

COLUMBIA-SOUTHERN CHEMICALS HELP BRIGHTEN

IDEAS ON PARADE . . . reviewed every day by the management team building and selling successful products. Their responsibilities range from research and design to marketing and delivery.

These men and women make the profit-creating decisions for going, growing businesses . . . rubber goods, glass, textiles, petroleum products, metals, plastics, paper, food, chemicals, soap, foils and wraps, cosmetics, pharmaceuticals, disinfectants and cleansers. A vital part of their jobs is spotting and applying new trends in materials selection, processing, and handling that produce better goods at lower cost.

The versatile basic chemicals brighten the prospect for continual improvement of almost all products and processes. Columbia-Southern, a leading producer of these essential industrial chemicals, can be a big help to your business as both supplier and technical adviser. Call Columbia-Southern with your next order. You'll soon see why Columbia-Southern chemicals, research, service, and technical assistance help brighten the future for products. The Columbia-Southern Chemical Corporation, One Gateway Center, Pittsburgh 22, Pennsylvania. Offices in principal cities. In Canada: Standard Chemical Limited.



first practicable all-colored tires, above, were developed by Columbia-Southern. You'll be seeing more-many more.

THE FUTURE FOR SO MANY PRODUCTS



LOOK AT CI2-CHLORINE

Highly reactive chlorine's transforming touch creates thousands of molecular regroupings necessary to economical processing of products ranging from solvents to plastics, wonder drugs to refrigerants.



LOOK AT NaOH-CAUSTIC SODA

Petroleum producers and cellophane manufacturers, textile and rubber makers, businesses by the dozens put caustic soda's voracious appetite to work "eating" away unwanted organic or inorganic compounds.



LOOK AT Na2CO3-SODA ASH

This versatile alkali serves as basic raw material or essential "refiner" in the manufacture of glass, chemicals, detergents, ferrous and non-ferrous metals, pigments, soap, textiles, paper and many other items.



LOOK AT H₂O₂-HYDROGEN PEROXIDE

One of Columbia-Southern's newer products, this compliant chemical has a range of reactions that permits its use for bleaching paper and textiles, as a rocket propellant, as a reagent in organic syntheses.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company

HCI — Muriatic Acid • TiCl₄ — Titanium Tetrachloride • Ca(OCl)₂ — Calclum Hypochlorite Chlorinated Solvents • Chlorinated Benzenes • Agricultural Chemicals • Chrome Chemicals

Give your product the big selling advantage of

CONTINENTAL



STYLE CANS



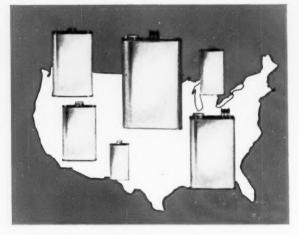
1. SAVES SHELF SPACE! Space saving oblong shape of "F" style cans allows more units to be stocked per shelf foot. Your product gets more attractive display, greater sales opportunity!



2. FAST AND EASY STACKING! Recessed bottom of "F" style can fits right into top of can below it. Stacking is no problem, display is secure. (Available on ½ pints, pints and quarts.)



3. SHOPPER STOPPING LITHOGRAPHY! Superb Continental lithography—the best in the industry—gives "F" style cans sparkling sales appeal. Broad surface of can provides more room for your sales message.

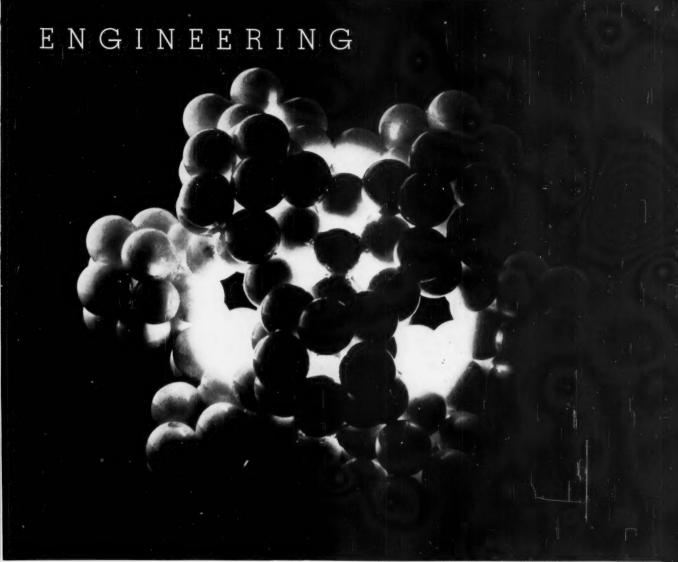


4. MORE SIZES...BETTER SERVICE! Choose from the widest range of sizes, from four ounces to one gallon. Get outstanding Continental service, fast delivery from points all across the U. S. Call *today*.





Eastern Division: 100 East 42nd Street, New York 17 Central Division: 135 South La Salle Street, Chicago 3 Pacific/Division: Russ Building, San Francisco 4 Canadian Division: 5595 Pare Street, Montreal, Que.



Seen in new light, Linde's molecular-sieve adsorbent debuts as carrier for too-reactive chemicals.

Molecular Sieves: Cure for Curing Problems

After more than three years as a promising commercial prospect, chemical-loaded molecular sieves last week graduated from Linde Co.'s Tonawanda, N.Y., laboratories, to the company's new-products department (CW Technology Newsletter, May 3).

Touted as a new concept in controlling reactions, these versatile and highly selective adsorbents can "hide" reactive ingredients (e.g., rubber accelerators, catalysts for plastics) in a chemical formulation, release them at the proper time for optimum curing of the product.

To plastics and rubber producers, says Linde, chemical-loaded molecular

sieves could solve many processing problems. Locked-in catalysts extend "pot life" of plastics, may permit many resins to be sold in premixed form. And molecular sieves, loaded with rubber accelerators, prevent premature curing, enable rubber processors to employ curing agents that are too volatile or otherwise unsuitable for conventional processing.

The first public disclosure of the use of chemical-loaded molecular sieves as the secondary accelerator in curing of styrene-butadiene rubber was made in Cincinnati last week (to American Chemical Society's Rubber Section) by Linde's F. M. O'Connor.

Structure Is Key: Molecular sieves' ability to hold highly reactive chemicals in check depends on their unique physical structure (CW, Nov. 20, '54, p. 64). Essentially a hollow sphere with openings of uniform, controllable size, each crystal serves as a microscopic reservoir (pores comprise about 50% of the total volume) that stores the selectively adsorbed chemical until it is driven out by heating. And the sieves' affinity for the adsorbed material enables them to hold highly volatile liquids-and even gases-that could not otherwise be kept for long in liquid formulations.

In the curing of silicone rubber,

What's new in processing chemicals?

News has a cash value for the chemical processor. Whether it's about new products or new applications for familiar products, this news can make the difference between keeping ahead of competition and having to catch up with it. This series of chemical news notes is designed to help you keep products, processes . . . and profits up to date.

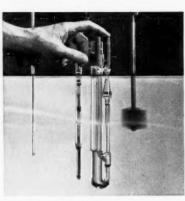
You may wish to check certain items in this advertisement and forward to those concerned in your company.

Route to:

BIG STIR FOR BETTER SOLUTIONS CREATED BY 3 NEW METHOCEL PRODUCTS

Production managers are looking eagerly over the shoulders of their research chemists these days and nights as they work overtime to get the most out of three newly announced Methocel® (Dow methylcellulose) products.

These three new products expand the already unequalled Dow line of synthetic gums (industry's widest), making available viscosities ranging from 10 cps. to 15,000 cps. Together with new techniques for putting Methocel into solution, they promise to open whole new areas of profitable use for



New high-viscosity Methocel being measured with pinpoint accuracy with Ubbelohde viscosimeter

these water-soluble, non-ionic gums. Reports are coming in from textile, paper, food and paint laboratories all over the country.

Here's what they're saying about . . .

METHOCEL 60 HG—"Better organic solubility and compatibility than other water-soluble gums yet still retains its water solubility." "Great for industrial paint removers, alkyd modified latex paints and coatings that must lay down a film from an organic solvent for fast drying." "Can be plasticized and made thermoplastic to heatseal coatings." "Better emulsifier and emulsion stabilizer because it's more surface active than other water-soluble gums."

DOW CHEMICALS... EXCITING



ETHYLENE AMINES

Three higher amines offer challenging potentialities as intermediates: Diethylenetriamine, triethylenetetramine, tetraethylenepentamine,



GLYCERINE

Expanded production facilities furnishing uninterrupted supply of three grades, synthetic, USP and USP 99.5%—all of unexcelled purity.



POLYPROPYLENE GLYCOLS

Polypropylene Glycol P2000 RG is but one of six resin grades that assure users exact degree of firmness or hardness in polyurethane production. **METHOCEL 70 HG**—"Exceptionally good for industrial emulsions such as asphalt and other petroleum based types."

METHOCEL 90 HG—"Completely solved our problem of thermal gelation." "No gelling at temperatures below 90°C. (194°F.) . . . at last we can take advantage of the non-ionic, surface-active and film-forming properties of Methocel."

METHOCEL 90 HG, 15,000 cps—"Very low concentrations of this high viscosity product gives us efficient thickening. Should result in substantial savings."

These reports have a familiar ring to the people at Dow. That's because they read like chapter and verse from the newly published Dow handbook on Methocel. This 60-page package of facts shows the versatility of Methocel as a thickener, stabilizer, film former, emulsifier and binder. In addition to describing the new products, it also reports on established members of the Methocel family . . . MC, 65 HG, CAM, AS-2, AS-4, and AS-8. Copies are available immediately from Dow.

After 20 years ...

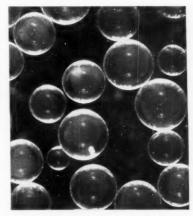
Ion exchange resins are being 'rediscovered'

In the 20 years or so since they were first discovered, ion exchange resins have softened oceans of water. These years of yeoman service have been worthwhile, but research chemists now probing the new uses for these resins find they've come across a basic, costsaving industrial process with many really revolutionary uses.

"It's like discovering you've had an Einstein working as a file clerk," said one chemist. "We've found valuable new uses for ion exchange resins in concentration, conversion, fractionation, purification and catalysis."

Actually ion exchange might be considered the latest link in the chain of chemical processing evolution. Dow production and technical service personnel have geared themselves for the forthcoming expansion. Current users have found ion exchange practical and beneficial for such uses as uranium recovery, de-ionization of glycerine and sugar solutions, epoxidation catalysis, rare earth separations and recovery of metal finishing solutions such as chrome plating baths.

A big processing advantage in the ion exchange method, chemical processors are finding, is that ion exchange resins can be produced in an almost infinite variety to fit specific needs.



Increased bead strength and stability in new white cation resin, Dowex 50W.

These resins are manufactured by Dow under the trademark Dowex®. Dow technical service specialists are constantly helping chemical processors apply the principle of ion exchange to a multitude of manufacturing problems. Complete information on the various resins in the Dowex line and the countless specialized formulations possible is available from Dow.

This settles it:

Separan 2610 breaks flocculation bottlenecks

When it came to separating solids from liquids, a lot of chemical processors found that their biggest industrial waste was *time*. But that was before Separan® 2610.

A glimpse at the record of this highspeed flocculant shows why so many processors are impressed by its performance. A uranium ore processor reports: "With Separan 2610 we can make one thickener do the work of five." A copper processor says: "Increased settling rates with Separan 2610 increased our ore processing capability 1,600 tons a day, cut unit costs, and prevented bottlenecks."

The stop-watch of a West Virginia coal operator clocked Separan 2610 doing a two hour settling job in seven minutes. A paper mill superintendent explained that a small amount of Separan 2610 as a filler retention aid has decreased costs \$10 per ton for 50 lb. offset bond while maintaining specifications.

In an ever-widening variety of thickening, filtration and clarification applications, Separan 2610 is solving many problems, clarifying plant influents, providing cleaner recycle water, and increasing solids recovery. Results are continually startling new users.

As one processor put it, "We didn't even know we could improve the economics of our operation until we learned about Separan 2610. We're still amazed!"

If you aren't already profiting from these and other Dow chemicals, we suggest you write for complete information to THE DOW CHEMICAL COMPANY, Chemicals Sales Department 750B, Midland, Michigan.

ALKALI Dow Caustic Soda Handbook—complete—authoritative. If you have not already ordered your copy of this new 86-page book, send for it today.

DOW CHEMICALS: Basic to the chemical processing industry

Alkylene Oxides, Glycols • Industrial Preservatives • Polyalkylene Glycols Glycol Ethers • Alkalies • Phenolic Compounds • Brominated and Chlorinated Aliphatic Compounds • Inorganic Acids • Halogens • Organic Acids and Esters Inorganic Chlorides, Bromides and Bromates • Nitrogen Compounds • Amino Acids • Glycerine • Salicylates • Phenyl Phosphates • Heat-Transfer Media Flotation and Flocculating Agents • Chelating Agents • Ion Exchange Resins Methylcellulose • Magnesium • Plastics • Aromatics

YOU CAN DEPEND ON







WHEN YOU WANT THEM...
WHERE YOU WANT THEM...

Imperial Chemical Industries Ltd.

Ammonium Chloride, Grey and White Ammonium Bicarbonate USP
Ammonium Carbonate Bleaching
Powder Tropical 34%-36% Cl₂
Calcium Formate Chlorinated
Rubber Copper Cyanide Potassium Cyanide
Rubber Sodium Cyanide,
all grades Zinc Cyanide Sodium
Aluminate Sodium Bicarbonate
USP and Tech Sodium Carbonate
Monohydrate Sodium Perborate
Trichlorethylene, all grades
Urea, 46% Tech. 3,3,5 Trimethyl
Hexanol 2:4 Dimethyl 6-Tertiary
Butyl Phenol Hexaphloroethane.

Peter Spence & Sons Ltd.

Aluminum Sulphate, Iron Free •
Ammonia Alum • Butyl Titanate •
Potassium Alum • Titanium Potassium
Oxylate • Cobalt Molybdenum
Catalysts.

British Oxygen Company, Ltd. Dicyandiamide.

Deepwater Chemical Co., Ltd.

Iodine, Resublimated USP and Reagent • Potassium Iodide, USP and Reagent • Potassium Iodate, USP and Reagent • Special Potassium Iodide Mixtures • Cupros Iodide, Tech. • Sodium Iodide.

Chemical Manufacturing Co.

714 W. Olympic Blvd., Los Angeles 15, Calif.
Richmond 9-4379

444 Madison Ave., New York 22, N. Y. MUrray Hill 8-8700

114 Sansome St., San Francisco 4, Calif. YUkon 6-3787

ENGINEERING

for example, di-tert-butyl peroxide (DTBP) produces a desirable stress characteristic (940 psi. after a 20-minute cure), but is too volatile to use in the conventional way. After two days in the pot, DTBP completely evaporates. Using chemical-loaded molecular sieves to lock in DTBP, Carbide's Silicone Division has been able to obtain 990-psi. curing with smaller amounts of curing agent, and even higher cures (to 1,080 psi.) after a pot-life of 14 days.

Another rubber process that is enhanced by use of chemical-loaded molecular sieves is the curing of neoprene Type W rubber. To minimize the curing time, neoprene Type W requires a lot of acceleration. But at high concentrations of accelerator, "scorch" (precuring at less than ideal curing temperature) becomes a problem. Catechol, for example, produces high-strength cures (1,500 psi.) at a concentration of 0.3 parts/100 parts of rubber, but causes the neoprene to scorch in about 3.5 minutes at 250 F. But when formulated with 3.0 pph. of CW-3010 chemical-loaded molecular sieves (loaded with catechol to 10% of the total weight), the neoprene cures to a strength of 1325 psi., has a scorch time of 31.5 minutes -only slightly less than the scorch time of unaccelerated neoprene.

By replacing secondary accelerators with faster-acting chemical-loaded molecular sieves, says Linde, rubber processors can get faster cures, less scrap from scorching, and greater safety in handling flammable or toxic materials. And the added cost of the new materials (estimated at about ½ é/lb. of rubber, on the basis of about \$3/lb. for chemical-loaded molecular sieves) should be more than offset by these processing advantages.

Wise Variety: Though Linde's initial commercial line-up contains only five standard reagent loadings—DTBP, catechol, piperidine, dinbutylamine, and diethylthiourea—the company has tested more than 200 other loadings, foresees many more likely combinations. To distribute and service the new product line, Linde two weeks ago completed a new marketing arrangement with Harwick Standard Chemical Co. (Akron, O.), which will handle all sales.

The only tricks required to produce loaded sieves: first determine the optimum loading for a given material,



If it can be palletized

Kennedy

can protect it-

... with flexible plastic film or any of many paper combinations—designed for long-time storage protection or temporary protection during handling.

If you palletize materials, parts or products—let Kennedy
... America's most versatile converter of papers and plastics
... protect them. Ask your nearest Kennedy engineer to show you how, or write to—

KENNEDY CAR LINER AND BAG CO., INC.

7000 Prospect Avenue, Dept. E Shelbyville, Indiana



PROBLEMS AND SOLUTIONS IN LACQUER TECHNOLOGY...

one of a series of ads designed to acquaint formulators with the properties and applications of the various types of cellulose acetate butyrate.

Which type of cellulose acetate butyrate would you select for this coating problem?

PROBLEM:

To formulate a lacquer resistant to dry-cleaning fluids

ANALYSIS: Because of the many chemical agents present in a drycleaning plant, this lacquer, first, must be capable of withstanding the attack of dry-cleaning solvents such as perchloroethylene and aliphatic hydrocarbons. Second, it must exhibit good moisture resistance. Third, it must

SOLUTION: Of the four types of Eastman cellulose acetate butyrate used as film formers, those of lower butyryl content, EAB 171 (17%) and EAB 272 (27%), generally have better chemical resistance than do those of higher butyryl content, EAB 381 (38%) and EAB 500 (50%). Although EAB 171 has the maximum resistance to solvents, EAB 272 is resistant to solvents usually encountered in the dry-cleaning industry. This consideration focuses our choice between these two types, because, while EAB 381 and EAB 500 have greater moisture resistance than do EAB 171 and EAB 272, their advantage in this respect is not sufficient to be of importance here.

By selecting EAB 272, greater compatibility is obtained with a larger number of plasticizers and resins. This permits the lacquer formulator to select the modifying agents that will further improve the moisture resistance and other properties of films

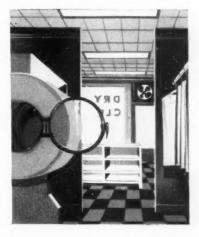
have a satisfactory degree of hardness, flexibility, toughness and stability to ultraviolet light. And, last, for ease of formulation, the type of cellulose acetate butyrate selected must be compatible with a wide variety of plasticizers and other modifying agents.

based on EAB 272, without compromising their chemical resistance.

In addition, EAB 272 is more soluble in common lacquer solvents than is EAB 171.

EAB 272, in common with all cellulose acetate butyrates, offers yet other advantages. In the lacquer maker's plant and in the final coating, the low flammability of cellulose acetate butyrate reduces fire hazards. Lacquers based on these esters exhibit outstanding color stability and resistance to weathering.

All Eastman cellulose acetate butyrates are available in at least two viscosity ranges. They are shipped as a fine dry powder in 50-pound multiwall paper bags. These esters dissolve readily to give clear, water-white solutions, are convenient to handle and are non-hazardous in storage. Advice on a specific formulation problem is available from your Eastman representative. We welcome your inquiry.



Authoritative, detailed information on the various types of cellulose acetate butyrate, including their chemical composition, physical properties and their use as film formers in metal lacquers, wood finishes, and textile and paper coatings is contained in Eastman's new 72-page booklet, "Cellulose Acetate Butyrate for Protective Coatings." It is a comprehensive, complete source file of fundamental information, reporting the results of years of work in formulating, testing and evaluating coatings based on cellulose acetate butyrate. Make sure a copy is always at hand by writing to the address below for yours.

Eastman CHEMICAL PRODUCTS, INC.

subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Massachusetts; Cincinnati; Cleveland; Chicago; St. Louis; Houston. West Coast: Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

MIN CHEMISTRY & work ... news briefs ON THE CREATIVE USE OF M&C PROCESS MATERIALS

*Papermakers: M & C makes over 1,000 tests per day to assure you highest quality Edgar Clays

Fact: More than a thousand individual quality control tests are made on Edgar Paper Clays each day in M & C mines and plants. That's the extent to which M & C goes to produce clays of outstanding high quality and uniformity. Illustrations show typical quality control checks-tests to insure M & C Edgar Clays meeting specifications for brightness, gloss, color shade, viscosity, moisture, etc. As a final check, samples are taken from each car-no shipment is allowed to move unless it meets both M & C and customers' standards. This is a starred item. Use the coupon.

> Testing begins with prospecting . . . cores must measure up to strict specifications



ASP-filled Reinforced Plastic van floor resists slams, bangs, scrapes saves 1,500 pounds in weight



Floors of moving vans must have superior impact strength and abrasion resistance to take the rough, tough treatment of long distance hauling. Van pictured uses fibreglas reinforced epoxy and polyester resins with high loadings of ASP 400-M & C's Aluminum Silicate Pigment filler -to make the floor and roof panels. Result: great toughness and weight savings of about 1,500 pounds per truck body. ASP fillers also permit ease of formulation, long pot life, excellent characteristics.

Outside House Paintsmade with ASP extenders - back durability with 6-year test

This painter knows how the job will stand up-and the paint manufacturer does too, thanks to M & C's long term test fence studies. You can't simulate all the vagaries of weather in laboratory testsonly actual exposure over a long period of time gives positive answers. Final tabulated results after 6 years of observation show M & C Aluminum Silicate Pigments in outside house paints contribute to excellent exposure ratings, superior brushing characteristics and low cost . . . detailed 12page bulletin and supplement tells all. Use the coupon for a copy.





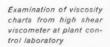
MINERALS &

CORPORATION OF AMERICA

Leaders in creative use of non-metallic minerals



Mine-site laboratory where brightness, residue and viscosity are under hour-by-hour test

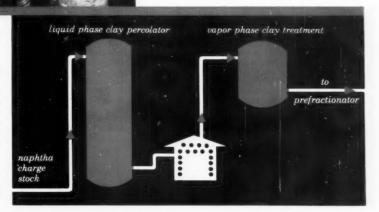




Final test of a loaded car - no car rolls without a control laboratory OK

Platinum Catalysts protected against poisonous compounds with Attapulgus Clay adsorbents

Flow diagram shows reformer feed stock passing through Attapulgus Clay-packed guard case" equipment where troublemaking constituents are removed by selective adsorption and catalysis. Some poisons need only be present at 10 parts per billion to permanently foul the catalysts. Low investment and prompt payout in terms of optimum production rate characterize this protective treating operation . . . poisons removed include Arsenic, Nitrogen, Tetraethyl Lead and Alkyl Sulfur compounds.



Use this quick two-check coupon >

- √ your product interest . . .
- we'll fill your requests immediately.

For more data, see your Chemical Materials Catalog Pages 358-362

6446 Essex Turnpike, Menlo Park, New Jersey Export Department: Room 150, Garden State Parkway,

Menio Park, N.J. (Cable Address: "MINCHEM")

MINERALS & CHEMICALS CORPORATION OF AMERICA 6446 Essex Turnpike, Menlo Park, N.J.

I'm interested in:

- *Paper Clays Reinforced Plastic filler
- Outside House Paint extender
 - Platinum Catalyst protection

Please send, without obligation:

data; samples;

prices; technical representa	prices;	technical	representa
------------------------------	---------	-----------	------------



Troubled by lumpy caustic?

It'll pay you to climb on the band wagon for Wyandotte Flo-chilled* Anhydrous Caustic Soda. It's K.O.'d that old bugaboo of caking and lumping in hot, humid weather—because it's Flo-chilled to flow free

and easy in your automatic machinery any time of the year. Order a supply from your Wyandotte representative or distributor today... you'll find it's the same price as ordinary caustic!

Look for this label . . . and be SURE!





Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

WYANDOTTE CHEMICALS CORPORATION, WYANDOTTE, MICHIGAN
Offices in Principal Cities

PACING PROGRESS WITH CREATIVE CHEMISTRY

ENGINEERING

then blend sieves and chemical under closely controlled conditions. And if the current crop of processors' sample requests is any indication, Linde's Tonawanda lab won't soon run out of new combinations to try.

PROCESSES

Ore Agglomeration: A new, largescale prototype of its grate-kiln system for agglomerating and heat-treating minerals and concentrates will be built by Allis-Chalmers Mfg. Co. (Milwaukee). First used for cement production (CW, Jan. 28, '56, p. 92), the grate-kiln wi' be evaluated for agglomerating iron ore concentrates to prepare them for blast furnace or open-hearth feed, pelletizing phosphate rock for electric furnace feed. The new pilot plant will feature increased flexibility, comprehensive instrumentation, increased capacity (42-in.x18-ft. rotary kiln; 13-ft.x22-in. traveling grate).

Stoker Coke: A traveling grate is also the key to continuous process for the production of stoker coke now being used by Island Creek Coal Co. The process involves feeding coking coal to a traveling grate stoker operated at double its normal speed. By control of air admission, the volatile matter in the coal is burned to provide heat for coking and to raise steam. Most of the fixed carbon in the coal is recovered in the form of small-size, porous, high-temperature coke.

Sugar Can Wax: A low-cost process for extracting hard, lustrous wax from sugar cane has been developed by U.S. Dept. of Agriculture. The process is said to be the only one so far devised that seems practical for use in small- and medium-size U.S. sugar mills. Principal steps in the process include slurrying the heavy, impure residue of the cane juice with hot heptane, filtration, evaporation and stripping.

Kraft Pulping: Continuous production of kraft pulp with a Pandia Chemi-Pulper system was inaugurated in Japan recently at the Nikko Mill of Takasaki Paper Mfg. Co. The system, supplied by Pandia Division of Black-Clawson Co. (Hamilton, O.), is being used to produce 120 metric tons/day of kraft pulp from beech and Japanese pine pulpwood.

U.S.I. CHEMICAL NE

May 24

A.I.Ch.E. Marks 50 Years Of Progress This June

The American Institute of Chemical Engineers celebrates its Golden Jubilee this year. During the week of June 22, leaders of the American chemical industries, internationallyknown figures in the chemical engineering field, and thousands of other members of the A.I.Ch.E. will gather at Philadelphia to attend technical sessions a. I the official banquet. and to witness the awarding of special achievement citations.

Since 1908, the American chemical process industries and the A.I.Ch.E. have grown together, helping each other advance into the present "Age of Chemistry." The A.I.Ch.E. has been a guiding force behind this progress. U.S.I. itself, founded in 1906 as a producer of industrial alcohol, could hardly have attained its present size and diversification without its chemical engineers and the organization behind them.

To quote the publisher of the Institute's official organ: "From the impressive plateau of its 50 years of progress, the American Institute of Chemical Engineers can look back with pride on a record of outstanding achievement. and forward with confidence to continued service to mankind."

New Lanolin Derivatives Soluble in Water, Alcohol

Polyoxyethylene derivatives of acetylated lanolin have been developed which are completely soluble in water, alcohol, and many oils and solvents. They yield persistent emollient films and have solubilizing properties desirable in cosmetics, pharmaceuticals, toiletries and aerosol formulations.

The materials are n a-greasy, clear liquids designed to give a so t, non-tacky after-feel when incorporated into water and alcohol preparations and emulsions. They are produced in two forms: completely acetylated for applications where a high alcohol content is essential; and partially acetylated for aqueous and weak alcohol preparations. The higher the degree of acetylation the greater the hydrophobic and substantive characteristics of

These new lanolin derivatives are suggested for aerosols, shave lotions and creams, hair tonics, rinses and shampoos, insect repellents and sunscreens, deodorants, anesthetics and antiseptics, among many other drug and cos-metic use possibilities.

Fluorinated Polyethylene Keeps Air and Gases Out. Odors and Flavors In

A recent patent claims that the addition of 0.03-3.5% by weight of fluorine to the surface of polyethylene films and bottles makes them substantially impermeable to atmospheric gases, perfume components, aromatic flavor constituents, and preserving or pressurizing gases. The proper-MORE

ties of the polyethylene remain

SRE and Shippingport Reactor Mark Important "Firsts" in **Atomic Power Program**

SRE First Reactor to Supply Heat to Conventional Power Plant; Shippingport First Complete Commercial Atomic Power Plant

The Sodium Reactor Experiment in Southern California - first non-military nuclear reactor to feed heat into commercial power generating equipment for conversion to electricity - is a sodium-cooled, graphite-moderated experimental

atomic power plant. Built for the Atomic Energy Commission, its purpose is to develop technical data for designing, constructing and operating full scale nuclear plants which will produce power economically.

In this reactor, liquid sodium metal in a closed system is circulated through the core, picking up reaction heat which it transfers to a second, non-radioactive closed sodium system. From this second system the heat is transferred to the power generation equipment of the Southern California Edison Company.

Sodium Coolant Has Advantages

Sodium makes an excellent reactor coolant because of its relatively low neutronabsorbing characteristics, good heat transfer properties, low melting point and high boiling point. High temperatures without high pressure can be produced when sodium is used as coolant.

As part of the experimental program, various fuel elements, components and structural assemblies are being studied in the SRE system. Right now the reactor uses uranium slightly enriched with uranium-235 in the core. Cores containing thorium-uranium alloys are planned for future investigation.

Shippingport Uses Zr, Hf, in Core

The new central-station atomic power plant at Shippingport, Pa. - first in this country to feed electricity into a commercial grid contains in its core some 14 tons of uranium clad in zirconium metal and zirconium alloy, and control rods made of hafnium and zir-



View of sodium-to-sodium heat exchanger which carries heat from SRE core to power gen-

Zirconium metal has an extremely low nuclear cross-section - allowing free passage of neutrons - and makes an ideal cladding and supporting material for uranium because it offers minimum interference to the fission process, is corrosion and heat resistant, and

structurally strong.

In the Shippingport reactor, the core is composed of 32 seed fuel elements containing about 165 pounds of highly enriched uranium clad with zircaloy. These seed elements are surrounded by 113 blanket fuel elements containing 14 tons of natural uranium clad with zirconium alloy.

Hafnium, although found closely associated with zirconium in nature, has the opposite type of cross-section characteristics. It absorbs neutrons readily, and consequently makes excellent control rod material. In the Shippingport reactor core, each of the 32 seed elements has its own two-part control rod. The absorber section is made of hafnium, the follower portion of zirconium alloy.

This pressurized water reactor plant started delivering electricity on December 18, 1957. It uses ordinary water to moderate the nuclear fission process, and the water under pressure is circulated through the reactor core to remove the heat. The hot water is pumped through heat exchangers to produce steam which in turn is used to power the generating turbines. The plant can deliver 60.000 kilowatts into the system of Duquesne Light.



At Shippingport during final stages of installation, reactor core is being lowered into pressure vessel. Zirconium-clad uranium fuel is contained erators. (photo courtesy Atomics International) in this core. (photo courtesy Westinghouse)

May 24

U.S.I. CHEMICAL NEWS

1958

CONTINUED Polyethylene

unchanged.

This development should make it possible to package foods, colognes, other toiletries containing perfumes, aromatic solvents, mineral and vegetable oils and aerosol formulations in polyethylene films or flexible containers without loss of volatile constituents or entry of deteriorating gases.

The fluorination process is claimed to be simple and economical. Film or bottles are washed free of lint, grease, dust and all foreign matter which might cause fluorine to ignite the polyethylene. After this, the film or container is contacted with pure fluorine or a fluorine-inert gas mixture, at room temperature or at up to 50°C. The length of contact varies depending upon the equipment, fluorine concentration, temperature and thickness of film or bottle.

While clarity, flexibility, tensile strength, heat sealability and ultraviolet transmittal are claimed to remain unchanged, permeability of the polyethylene is decreased many fold. In a typical test with a volatile liquid, 5.6% of allyl caproate was lost from an untreated polyethylene bottle in 40 days. Only 0.05% was lost from a bottle which had received a six-hour fluorine treatment. Testing for oxygen transfer, an untreated film transmitted 303 cc per 100 square inches of surface in 24 hours. A treated film transmitted only 46 cc.

Silicone Additives Insure Uniform Cell Structure in Flexible Urethane Foams

Silicones are now being added to flexible polyurethane foams to give smaller, more even cell structure, uniform resilience and flexibility, and better appearance.

One type is a water-dispersible emulsion which can be added directly to the catalyst phase of the foam system. The manufacturer recommends that it be added as the last component when making up this phase, and claims

that it will remain uniformly dispersed from several days to two weeks in most catalyst systems. Another type is a fluid added directly to the prepolymer and dispersed by thorough

Flexible polyurethane foams have evoked wide-spread interest as insulation for both industrial and consumer use, as cushioning, and for a variety of specialty applications. They can be produced from the reaction of polyesters with diisocyanates. An intermediate that can be used to produce the polyesters is U.S.I. ISOSEBACIC® Acid, a mixture of C-10 dibasic acids.



Polyurethane foam containing silicone additive has smaller, more uniform cell structure than other samples containing no silicone.

New Sterilizing Method Employs Ethylene Oxide in Safe Aerosol Formulation

The U. S. Department of Agriculture's Entomology Research Division reports that they have found a way to combine highly volatile ethylene oxide with ordinary aerosol propellants to form a non-flammable sterilizformulation.

Ethylene oxide is a known germicide, insecticide and sterilant, but its highly flammable nature has been a deterrent to its widespread use for these applications.

The new aerosol is designed for sterilizing sensitive materials which cannot stand treatment by steam, dry heat or liquid chemicals.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Radioactive isotopes and isotope-labeled compounds are described in a new price list now available. Included are C-14 compounds, heavy water, deuterium and tritium-labeled compounds, N-15 compounds of high isotopic concentration.

Fatty amines are discussed in new 24-page book-let covering method of manufacture, applications, chemical reactions, vapor pressure, solubility and handling. No. 1351

1723 Voluntary national standards approved by the American Standards Association are listed in free 67-page index just published. Standards in fields of chemicals, petroleum, rubber, textiles, are included among others.

Sodium dispersions which improve chemical reaction efficiencies by providing more active surface area are described in 42-page booklet. Latest production equipment for continuous preparation of dispersions covered.

Paper-strip electrophoresis analysis of various proteins, hemoglobins, amino acids and many organic and inorganic mixtures is outlined in a new catalog describing equipment for the pur-

New organic phosphate insecticide (O,O-diethy) S-p-chlorophenyl-thiomethyl phosphorodithicat is claimed non-systemic, long-residual, less ha ardous than many other organic phosphates. For control of mites and broad range of other

Plastic pipe for safe transportation of drinking water is discussed in new 12-page folder. Includes types of plastics used, method of joining lengths, suitable applications, standards st by Natl. Sanitation Foundation.

No. 1356

Chemical analysis of solid surfaces by nuclear methods is described in 33-page U.S. Army report which can now be purchased. Methods used to detect all elements to depth of several microns (sensitivities from 104-1016 gm/cm²). No. 1357

Dangerous properties of over 8,500 chemicals, and safe practices in handling, storing and shipping, are outlined in a 1476-page book just put on sale. Toxicity, fire, radiction, air pollution, explosion hazards are covered.

No. 1358

Tritiated thymidine is now offered in research quantities as a new tool for studies of growth.
Material is said to be suitable for investigating
cell formation and turnover, genetic patterns,
effects of intracellular radiation and growth inhibition in neoplasms.

PRODUCTS OF U.S.I.

HEAVY CHEMICALS

Sodium, Metallic: cast solid in tank cars, steel drums, pails; bricks in barrels, pails.

Sodium Peroxide, Sodium Sulfite, Sodium Sulfate

Ammonia, Anhydrous: commercial & refrigeration. Tank cars or tank wagons. Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions

Phosphatic Fertilizer Solution: wet process phosphoric acid. Sulfuric Acid: all strengths, 60 Baume to 40% Oleum. Also Electrolytic grade

to Federal specifications. Tank cars or tank wagons. Caustic Soda, Chlorine

OTHER PRODUCTS

PETROTHENE® Polyethylene Resins

Pharmaceutical Products: DL-Methianine, N-Acetyl-DL-Methianine, Urethan USP, Riboflavin USP, Intermediates.

Alcohols: Ethyl (pure and all denatured formulas); Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL PR.

Organic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, anic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil, Ethyl Accotate, Normal Butyl Acctate, Diethyl Carbonate, DIATOL®, Diethyl Oxalate, Ethyl Ether, Acetone, Acetoacetarilide, Acetoacet-Ortho-Chloranilide, Acetoacet-Ortho-Toluidide, Ethyl Acetoaceto-Ethyl Benzoylacetate, Ethyl Chloraformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate, ISOSEBACIC® Acid, Sebacic Acid, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P., Pelargonic Acid, Carbanate, Acid and 2-fished Mantagair Acid Acid, and 2-Ethyl Heptanoic Acid.

Animal Feed Products: Antibiotic Feed Supplements, BHT Products (Anti-oxidant), Calcium Pantothenate, Choline Chloride, CURBAY B.G. (S.), Special Liquid CURBAY, VACATONE®, Menadione (Vitamin K.), DE-Methionine, MOREA® Premix, Niacin USP, Riboflavin Products, Special Mixes, U.S.I. Permodry, Vitamin B₃₂ Feed Supplements, Vitamin D₃, Vita-min E Products, Vitamin E and BHT Products.

NOUSTRIAL CHEMICALS CO.

Division of National Distillers and Chemical Corporation 99 Park Avenue, New York 16, N. Y.

U.S.I. SALES OFFICES

Atlanta · Baltimore · Boston · Buffalo · Chicago · Cincinnati Cleveland • Dallas • Detroit • Houston • Indianapolis • Kansas City, Mo. Los Angeles • Louisville • Minneapolis • Nashville • New Orleans New York • Philadelphia • Pittsburgh • Portland, Ore. • St. Louis Salt Lake City . San Francisco . Seattle

Technology

Newsletter

CHEMICAL WEEK May 24, 1958 The borane-processing picture is a lot clearer this week. Olin Mathieson, which formally dedicated its \$4.5-million Navy plant last week, had almost nothing to say about the process or products (*CW*, *May 17*, *p. 23*). But from the plant tour given the press and from previously established information (*CW*, *July 20*, '57, *p. 35*), it's now possible to put together a fairly complete process description:

Sodium borohydride (from Metal Hydrides' Navy plant in Danvers, Mass.) is brought into the OM plant in drums, loaded into a kettle, where it's slurried with toluene. In a smaller kettle nearby, anhydrous aluminum trichloride is also slurried with toluene. Both slurries are fed to a reactor, where boron trichloride (shipped in by tank car from Stauffer's plant in the area) is reduced to diborane.

The trick is to get good yields, using toluene. This is made possible by the aluminum trichloride. Herbert Brown and co-workers at Purdue, for example, showed it's possible to get good yields in reducing the trichloride with sodium borohydride when the reaction medium is an ether (Journal of the A.C.S., p. 1552, 1958). They also have done work indicating that aluminum trichloride enhances the selectivity of sodium borohydride as a reducing agent. Presumably, it's the same sort of activity that enables OM to carry out the process in toluene.

The diborane is then pyrolized to pentaborane. That, in turn, is alkylated to form HEF-2. The alkylation step is thought to be an ethylation, done by reacting the pentaborane with a chlorinated hydrocarbon (presumably ethyl chloride) in the presence of a ferric chloride catalyst.

An alternative to alkylating the pentaborane would be to tack the alkyl group on diborane. That's what Callery will do both in its own plant and in the \$38-million plant it is building for the Navy. In the latter, it will likely use ethylene made from ethanol in a Foster Wheeler-built plant (CW Techonology Newsletter, Nov. 16, '57). This method, incidentally, explains Callery's interest in the simpler alkyl boranes (R₃B).

OM is known to have experimented with that approach, too. Apparently, though, it is convinced that for its set of variables, alkylation of the higher borane is better: in the \$45-million plant it is building for the Air Force to make HEF-3 (alkylated decaborane), it will probably use the same approach. In fact, producers of ethyl chloride are now preparing bids to supply the plant, which—when it gets into full operation—should use some 3 million lbs./year. (In this plant, OM will reduce the boron trichloride with lithium hydride rather than with sodium borohydride.)

The precise structure of the finished fuels is still in the field of speculation. A sound bet is that they are tri-ethyl boranes. Higher members in the series, however (e.g., HEF-5), might indicate higher alkyl substituents (e.g., butyl).

Technology

Newsletter

(Continued)

The first interurban high-purity oxygen supply network—7½ miles of 12- to 20-in. pipe—will link a new 1,000-tons/day oxygen plant at U. S. Steel's Duquesne, Pa., Works with three of the company's other plants on the Monongahela River, south of Pittsburgh. Scheduled for completion in 18-24 months, the new oxygen plant will be built and operated by Linde Co., will replace the smaller-capacity Linde plants now operating at USS's Homestead Works (Munhall, Pa.), Edgar Thomson Works (North Braddock, Pa.) and National Tube Division's National Works (McKeesport, Pa.). The 500-tons/day oxygen plant installed at Duquesne last June (CW June 15, '57, p. 92) will be kept in service; Linde will put the three smaller units back on the shelf.

A new oral contraceptive? Upjohn is calling its newly synthesized steroid 6a-methyl-17a-hydroxyprogesterone 17-acetate "the most active progestational agent yet known."

Dow's larvacide Dowlap (3,4,6-trichloro-2-nitrophenol) racked up a 100% kill of lamprey larvae in a recent field test in Carp Creek (Black Mallard River) near the Hammond Bay, Mich., laboratory of the U. S. Bureau of Commercial Fisheries. Damage to desirable gamefish and stream life was negligible: snails showed some effect but later recovered; clams were "hard hit," according to Fisheries Bureau researchers Vernon Applegate and John Howell. Both called the test "highly successful."

Deuterio rubber—a new man-made variety that's more rubbery than the natural product—has been synthesized at B. F. Goodrich Research Center (Akron, O.) by a research team under the direction of David Craig.

Deuterio rubber is said to have good tensile qualities in pure gum stock, can be vulcanized exactly like crude rubber and doesn't require carbon black reinforcement to give high tensile properties. But it's too costly to consider for commercial applications, will be used only in research studies into rubber properties, such as heat, radiation and oxidationresistance and gas permeability.

The product is made by completely replacing the hydrogen atoms attached to the long-carbon-chain rubber molecules (Craig worked with isoprene) with atoms of deuterium obtained from heavy water. Because the deuterated molecules attract each other less strongly than do the normal hydrogen-bearing types, the substitution produces a more fluid, more elastic rubber.

AEC last week dropped the aqueous homogeneous reactor project proposed by Wolverine Electric Cooperative (Big Rapids, Mich.). Wolverine's analysis indicated generating costs of the proposed plant would be several times greater than present rates. AEC will continue Homogeneous Reactor Experiment No. 2 at Oak Ridge National Laboratory.

PETRONATE

(Reg. U. S. Pat. Office)

. . . the oil-soluble petroleum sulfonate for all four major functions . . .

- A Emulsification and Dispersion of Liquids
- B Dispersion and Wetting of Solids
- C Wetting and Dispersion of Liquid-Solid Systems
- D Inhibition of Rust and Corrosion

PETRONATE is the general trade name given by Sonneborn to its various types and grades of oil-soluble petroleum sulfonates.

The chart suggests the broad range of uses for this material. A laboratory sample of PETRONATE will.

help you determine how its many advantages can be put to efficient use in your manufacturing processes.

Check the coupon below indicating the use intended so that we can send you the proper type of PETRONATE.

USES OF PETRONATE

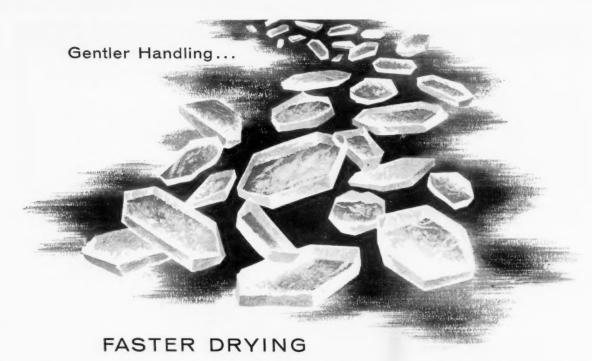
APPLICATION	PRIMARY FUNCTION OF PETRONATE	SECONDARY FUNCTION
	EMULSIFICATION AND DISPERSION OF LIQUID	os
1. Insecticide Emulsions	Emulsifying Agent for Toxicant	Spreading Agent
2. Textile Oils	Emulsifying Agent for Textile Processing Oils	Wetting and Dispersing Agent for Textile Fibers
3. Leather Oils	Emulsifying Agent for Leather Processing Oils	Wetting and Dispersing Agent for Leathers
4. Drilling Mud	Emulsifying Agent for Oil	Surface Tension Depressant
	DISPERSION AND WETTING OF SOLIDS	
5. Rubber Manufacture	Thermo Plasticizing Agent	Increases Dispersibility of Filler
6. Fuel Oil	Keeps Sludge in Suspension	Prevents Segregation of Moisture
7. Printing Ink Manufacture	Aids Dispersion of Pigment	Reduces Viscosity of Ink
8. Ore Flotation	Flotation Reagent	Selective Wetting Agent
9. Additives for Lube Oil	Acts as Detergent	Inhibits Bearing Corrosion
	WETTING AND DISPERSION OF LIQUID-SOLID SYS	TEMS
10. Crude Oil Emulsion Splitting	Reverting Agent for Water-in-Oil Emulsions	Aids in Wetting out Salts and Solids
11. Emulsifiable Solvent Cleaners	Dispersing Agent for Oil and Grease Deposits	Acts as Emulsifying Agent
12. Dry Cleaning Compounds	Linking Agent for Water and Solvent	Loosens Dirt Absorbed by Fabric
13. Fat Splitting Process	Dispersing Agent for Solid Fats	Acts as Wetting Agent
	INHIBITION OF RUST AND CORROSION	
14. Corrosion Preventive Compounds	Rust and Corrosion Inhibiting Agent	Acts as Moisture Barrier
15. Anti-Freeze Solutions	Rust and Corrosion Inhibiting Agent	Aids in Dispersion of Scale
16. Soluble Cutting Oils	Emulsifying Agent for Mineral Oil	Rust Inhibitor

Sonneborn

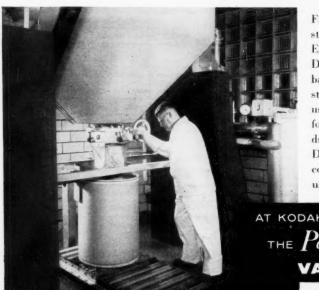
L. SONNEBORN SONS, INC. New York 10, N. Y.

Specialists in White Oil, Petrolatums and Sulfonates for More than Half a Century

Ple circ	Four ease	th A	ven i sar	ue, l	New	Yor	k 10	NAT		itable	e for i	use in	dicat	ed be	ow
1									10			13	14	15	16
Nam	1e														
Com	pan	у													
Add	ress														_



for famed KODAK ELON*



Faster drying at the final step of manufacture substantially increases production efficiency for Kodak Elon—thanks to Patterson's unique CONAFORM Dryer. Rapid and completely uniform drying of the batch is achieved without deterioration of crystal structure. The delicate crystals of Kodak's widely-used developing agent are preserved by the Conaform design, as the unit revolves slowly during the drying cycle. • Replacing tray ovens, the Conaform Dryer provides clean and dustless operation with complete absence of caking or contamination. Let us cite the comparisons for you.

THE Patterson Conaform BY VACUUM DRYER

*Mono-methyl-para-aminophenol sulphate

ADVANCED
PROCESS EQUIPMENT
OF ENDURING SATISFACTION
PROCESS EQUIPMENT

Patterson foundry and machine company

THE Patterson FOUNDRY AND MACHINE COMPANY (Canada) LIMITED

RESEARCH



Esso's Leon Shore heads project aiming for 'cleaner' gasoline.

No Deposits Pay a Dividend

This week, Esso Research and Engineering Co. took the wraps off a new clean-burning gasoline, a payoff on the company's investment in radiation for research.

The \$750,000 project, supervised by section head Leon Shore (above), had been in the works 3½ years, was

aimed at removing deposit-forming components from gasoline products.

By using carbon-14 as a tracer, Esso claims to have picked out the hydrocarbons that cause efficiency-reducing engine deposits. Culprits: high-boiling aromatics—long sidechain olefin or paraffin derivatives of benzene and condensed-ring hydrocarbons.

The work was tedious. Samples of gasoline constituents were tagged with C-14 and mixed with standard gasoline in a ratio of three parts per million. The resulting deposits formed by burning the mixture were checked for radiation-the greater the radioactivity, the greater the deposit-forming tendencies of the tagged compound. Of the three types of hydrocarbons present in gasolinearomatics, paraffins and olefins-the high-boiling aromatics turned out to be the worst offenders. In fact, Shore claimed, the boiling points of aromatics were almost in direct relationship to the amounts of deposit.

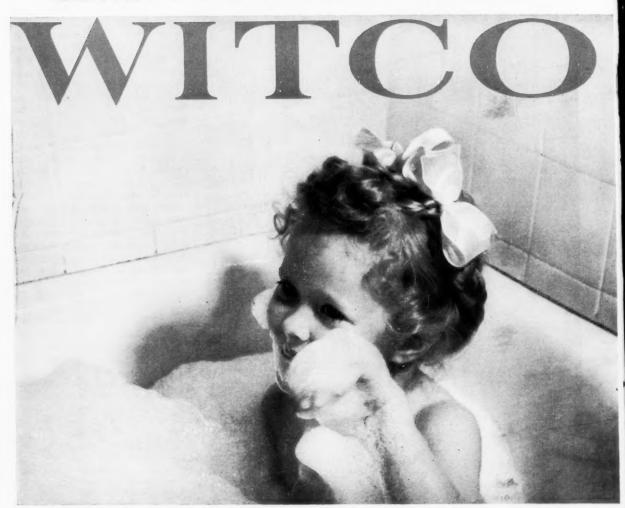
Ultraviolet Assist: Another tool Esso researchers used to correlate deposit, boiling-point data was ultraviolet absorption equipment. They again found an almost direct relationship between uv. absorption and concentration of heavy aromatics. And a final review of research findings showed that, if the aromatics were removed, the olefins and paraffins became insignificant deposit-formers. Esso claims it is spending \$1 million more yearly to produce the new type of gasoline.

Agent Added: Even using the cleanest hydrocarbons in gasoline will not eliminate engine deposits, admits Esso. But it claims to have come up with an agent to minimize deposits, lower the octane requirements. Although the company won't say what the agent is, it's known to be partly hydrocarbon and completely combustible.

Conventional agents used to date have cut down surface-ignition (caused by the deposits igniting and, in turn, firing the fuel-air mixture at uncontrolled times). But they increase spark-knock (where deposits limit removal of heat from the chamber, cause fuel-air mix to burn unevenly). Result: no savings in octane requirements. Esso claims its new agent will reduce surface-ignition as conventional agents do, and will also keep down spark-knock, lower the octane requirements, and also act to reduce deposits on older engines.

In any case, it's a sure bet that Esso's work will intensify interest in this phase of gasciine technology. Improving products, smoothing processes, cutting costs,

ULTRA DETERGENTS SYMBOLIZE ...



Millions of bubbles make an appealing picture and insure adequate coverage for modesty. Sulframin® AB 40 beads' highly effective foam exhibition and wetting properties are particularly valuable in the manufacture of cosmetic products.

Other products manufactured by Witco and its divisions are:



Stearates Stabilizers Driers Plasticizers Rubber Chemicals Gelling Agents Extender Pigments

Specially prepared Bituminous Compounds and Mastics Synthetic Detergents Detergent Additives Spray-dried Chemicals Organic Chemicals

Channel and Furnace Blacks

Emulsifiers and Surface Active Agents for agriculture, foods, cosmetics, and other industries

WITCO CHEMICAL

122 East 42nd Street, New York 17, N. Y.

14 Manufacturing Plants—7 Research and Technical Service Laboratories, Sales Offices in Principal Cities

chemicals at work

In detergents and wetting agents, Witco's Ultra Division has developed outstandingly efficient compounds which improve products and processes yet lower manfacturing costs. Their value is proved in many fields, from cosmetics to leather processing, textiles to dishwashing.

Detergents are only one product line of one Witco division. The company manufactures a wide range of other industrial chemicals in bulk quantities. Stearates, rubber chemicals, emulsifiers, asphaltic compounds, carbon blacks...whatever the product, the name Witco guarantees high quality.

Witco has specialized technical service laboratories, too...on call at all times to help customers solve any processing or raw materials problems. On your behalf, they will investigate new manufacturing techniques or evaluate old ones.

When you buy Witco, you buy highest grade chemicals plus unsurpassed service. At some point in your processes or products, Witco chemicals can be of benefit to you. Write today for details on how Witco can help solve your manufacturing problems.



Ultra Sulframin® E Liquid finds wide use in car and bus laundries. Readily soluble even in cold water, it combines maximum detergency with complete and easy rinsability.



Uniform textile dyeing becomes a simple operation when fibers are processed with Ultra's outstanding fulling and scouring agents and dyeing assistants.

COMPANY



k 17, N.Y.	its and other prod-
	its and other prod-
	State

BISHOP Platinum Craftsmanship is Important to you

With 114 years of quality craftsmanship behind it every BISHOP Platinum product is your assurance of perfect performance, to your standards, in the laboratory . . . in industry.

BISHOP Platinum apparatus meets the rigid specifications of the nation's research and control chemists. Time proven designs assure speed and accuracy in routine work.

You can depend on all BISHOP products:

Bimetals
Electrodes
Foil
Laboratory Apparatus
Precious Metal Catalysts
Noble Metal Salts & Solutions
Tubing
Wire



J. BISHOP & CO. PLATINUM WORKS

Malvern, Pennsylvania

RESEARCH

EXPANSION

 Betz Laboratories Inc. (Philadelphia) has started construction of new research facilities, will step up research on industrial water problems, particularly on corrosion control, scale formation.

North American Aviation Inc.
 (Canoga Park, Calif.) plans to spend
 \$1.25 million to expand its Canoga
 Park nuclear field laboratory facilities.

 J. Landau & Co. (Carlstadt, N.J.) has added a special finishes research division, will increase research in epoxy finishes, butyrate coatings.

PRODUCTS

Aluminum Powder: Hummel Chemical Co. (New York) now offers two grades of USP aluminum powder: 45 KM Silverwhite (170 mesh) and 55 KM Silverwhite (325 mesh).

Labeled Hydrocarbon: Iso-octane-C¹⁴ (2,2,4-trimethyl pentane-2,4-C¹⁴) is now available from Research Specialties Co. (Berkeley, Calif.). Expected application: hydrocarbon and petroleum research involving combustion and kinetic mechanism studies. Specific activity of the present stock is 2.86 mc./mM.

Hydrocarbon Standard: American Petroleum Institute (Carnegie Institute of Technology, Pittsburgh) has 2,3,4-trimethyl-2-pentane standard samples available. Price: \$50/5 ml.

Muscle Relaxant: 2-phenyl-2-hydroxyethylcarbamate, synthesized by Armour Laboratories (Kankakee, Ill.), has shown excellent muscle relaxing qualities without interference with judgment or voluntary muscular activity, Armour claims.

Antihail Agents: Western European nations report researching several hygroscopic compounds, aimed at turning hail to rain. England is working with kaolin; France, copper sulfide; Switzerland, silver iodide; Italy, ionized oxides.

New Amines: 1,3-diamino propane and imino-bis-propylamine are now available from Union Carbide Chemicals Co. (New York). The former has use in textile crease-resistant resins, surfactants, dyestuffs; the latter, in textile softeners, ion-exchange resins, insecticides. Both are available in commercial quantities.

Pure Peroxide: Fisher Scientific Co. (Pittsburgh) is out with a high-purity hydrogen peroxide 50% solution. It is suggested for organic oxidation, removal of metallic impurities from metallic salts. Price: \$3.75/lb.

Linking Agent: A new dithiol, glycol dimercaptoacetate is now available from Evans Chemetics Inc. (250 East 43rd St., New York). Suggested use: as a cross-linking agent.

LITERATURE

• "Nickel and Its Alloys" is a new circular (No. 592) available from the Supt. of Documents, U.S. Government Printing Office, Washington. The 60¢ booklet is a manual of recovery and refining methods, uses, optical, thermal, electrical, magnetic and mechanical properties, and a list of 800 other references to nickel.

• "Determination of Dissolved Oxygen in Water" (Special Technical Publication 219) is available from American Society for Testing Materials (Philadelphia). This hard-covered book is a collection of papers by scientists who have devised systems for oxygen determination; it covers advantages, disadvantages of each method. Price: \$2.25.

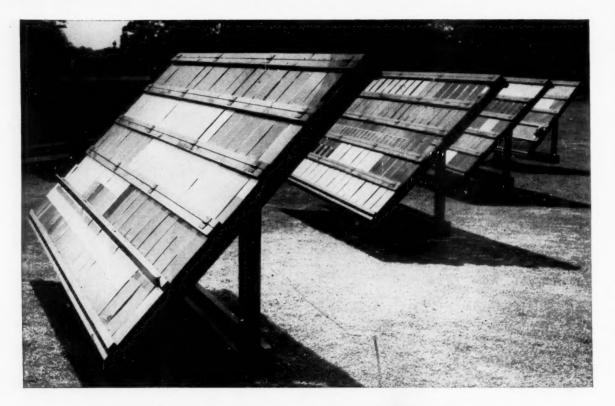
REPORTS

These reports are available from the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.:

• Preliminary Design Study of a Food Irradiation Reactor, Phase 2, discusses the major research, development, design and operational problems anticipated in the creation of a reactor capable of handling 3,000 lbs./hour of food. The plant consists of a light-water cooled and moderated heterogeneous reactor core surrounded by a blanket of indium sulfate, is expected to be in operation by October. Order AECU-3320, price: \$2.50.

• A Survey of The Literature of Rhenium (PB 121826, \$4.50) is an accumulation of information written during the past 27 years, concerning rhenium, All references are listed.

needs, specially lined or unlined standard steel drums or pails, Inland warehouses can provide your plant with immediate delivery of steel containers. No need to tie-up costly space or working capital with heavy container inventories. Whatever your ... there is an Inland Steel Container Company warehouse near you ready to The Inland Steel Container Company representative in your locality will be glad to discuss your requirements with you. Or write for further information. JUST A SHORT "HOP" AWAY! NEW ORLEAN GREENVILL supply them-without delay! O DALLAS ST. LOUIS CHICAGO KANSAS CITY O CONTAINER Member of the action Steel Family INLAND STEEL COMPANY Full line of steel and stainless steel shipping containers, including galvanised and heavy duty ICG drums. 6532 South MenardAvenue Chicago 38, Illinois Plants: Chicago · Jersey City New Orleans · Cleveland and Greenville, Ohio



IDEAS FOR TOMORROW ARE ON OUR FENCES TODAY

Selling quality PE is our business, but so is supplying up-to-the-minute technical information on its properties—and what they can mean to you. That's why at Hercules research on protective coatings of all types is an ever continuing project.

To make this information from our special coatings service laboratory fully useful to you, Hercules maintains a nationwide sales and technical service staff in 12 district offices.

Thus, our facilities are always available to you when you need assistance in solving any coating problem—whether it's in industrial finishes, lac-

quers, trade sales, or specialty items.

When it comes to the PE itself, manufacturers know they can depend on Hercules to supply a uniformly high-quality product that delivers consistent performance time after time. Whether you're making PE alkyds, esters, drying oils, or other derivatives, you'll find that Hercules PE can help you meet your exact specifications no matter how close they may be.

For a quality pentaerythritol backed up by full technical assistance and nationwide warehouse facilities, just call your nearest Hercules office.



Synthetics Department

HERCULES POWDER COMPANY

900 Market Street, Wilmington 99, Delaware



PE Plants at Mansfield, Massachusetts, and Louisiana, Missouri. Synthetic Resins Plants at Burlington, New Jersey, and Hattiesburg, Mississippi. Sales Offices and Warehouses in all principal cities from coast to coast.

Market Newsletter

CHEMICAL WEEK May 24, 1958 Extension of Publicker's lease on the government-owned plant for producing butadiene from alcohol (at Louisville, Ky.) will have little impact on the market; the company said it has no intention of starting up the unit. Publicker's lease expired early last month, but, says a spokesman, the government "asked us to stay on as custodian of the shut-down plant." The lease-extension, signed recently, will run "indefinitely."

But there are still some unsolved, two-year-old questions. Most perplexing, as far as Washington is concerned: What to do with the aging plant?

At one time, need was acute for alcohol-butadiene to keep the synthetic rubber program going; but since then, U.S. capacity to produce less-expensive butadiene from petroleum has soared (CW, Jan. 28, '56, p. 80), is today far in excess of demand. A couple of years ago, Union Carbide, among others, was interested in buying the Louisville installation for general chemical production, but balked at giving the government "reasonable assurance" that it would continue butadiene output using the outmoded and expensive alcohol route.

A bill introduced in Congress last year to remove the now unnecessary restrictive "defense insurance" clause to speed up sale of the plant failed to pass. The big poser today, as it was in late '56: whether the "insurance" quality attached to the Louisville plant is worth the cost of maintaining the installation in stand-by condition. Economy-minded Washington cost-cutters might be looking for the answer soon.

Startup of full-scale production at a new silicon plant will save customers money. Early last week, Du Pont announced sharp price cuts—ranging from \$5 to \$40/lb.—on all grades of "hyper-pure" silicon, coincident with full commercial operation of its plant near Brevard, N.C. The new installation will be able to turn out 50,000 lbs./year of semiconductor-grade and 20,000 lbs./year of solar-grade silicon.

It's the second Du Pont silicon price cut in little more than a year (CW Market Newsletter, April 13, '57), brings semiconductor-grade silicon tags down from a \$160-\$360/lb. range to a spread of \$130-\$355/lb. Solar-grade material is down \$10/lb. from a previous \$100; when introduced in '56 the latter sold for \$190/lb.

Price reductions of 40-90% on rare-earth oxides and salts are being listed by Nuclear Corp. of America (Calif.). Reason for the big cuts: greatly increased volume of use resulting from new applications in nuclear, metallurgical, petroleum and electronic industries.

Cut 90% is the price of 99%-pure lutetium oxide, bringing the tab down from \$150/gram to a relatively low \$15/gram. Prices of high-purity oxides of thulium, europium and neodymium are down 80-85%;

Market

Newsletter

(Continued)

also posted are reductions on rare-earth chlorides, nitrates, fluorides, sulfates and acetates. And available for the first time is new high-purity (99.8% minimum) terbium oxide and holmium oxide.

Price of lead has been shaved $\frac{1}{2} \frac{e}{lb}$. by American Smelting and Refining. The new price, $11\frac{1}{2} \frac{e}{lb}$, is still about $2\frac{1}{2} \frac{e}{lb}$. higher than the current tag in London, but the U.S. firm hopes the decreased differential will win back some U.S. lead buyers who have, in recent months, been buying increasing quantities of the metal from foreign suppliers.

Secretary of Interior Seaton has indicated that, rather than raise tariffs, the Administration favors so-called "equalization payments" to domestic miners. Because an early tariff increase is considered improbable, American Smelting is adjusting the price of lead to a "more normal relationship with the open world-market as reflected on the London Metal Exchange."

Major lead pigments were pressured downward by the metal price cut. The $\frac{1}{2} \frac{e}{l}$ b. reduction establishes these lower c.l. prices: red lead (95%), $13\frac{3}{4}\frac{e}{l}$ b.; litharge, $13\frac{1}{4}\frac{e}{l}$; orange mineral, $16.10\frac{e}{l}$ b.

Prices of tetraethyl-lead antiknock compounds were also reduced, with news of the lead decline. And as usual, Du Pont and Ethyl Corp. simultaneously were notifying customers of fractional reductions in their comparable products. Du Pont's new prices: Motor Mix, $36.476 \phi/lb$.; Motor Mix A, 36.07ϕ ; Aviation Mix, $40.057 \phi/lb$. Ethyl's TEL content tags (actually equivalent to Du Pont's "compound" prices): Motor Mix, $59.33 \phi/lb$.; Motor Plus, 60.33ϕ ; Aviation Mix, $65.23 \phi/lb$.

First metal-organic compound moving out of Metal & Thermit's new \$3.5-million plant at Carrollton, Ky., is dibutyltin oxide. The material is used as a catalyst in condensation reactions and as an intermediate in production of other organotin chemicals.

Also produced at the plant is bis(tri-n-butyltin) oxide, a biocide used by the paper industry, and dibutyltin dilaurate, used in poultry medicines. Other products will be added to the list.

SELECTED PRICE CHANGES - WEEK ENDING MAY 19, 1958

OWN	Change	New Price
	\$0.005	\$0.115
Lead metal, prime, pigs, N.Y.	*	*******
Lead, red, 95% Pb ₃ O ₄ or less, bbls., c.l., wks., frt. equald.	0.005	0.1375
Litharge, coml., powd., bbls., c.l., wks., frt. equald.	0.005	0.1325
Sodium gluconate, tech., dms., bgs.	0.0075	0.37
Tankage, animal feeding, 9-11% ammonia, Chicago, bulk, ton	0.50	8.00
Tin metal (Straits)	0.005	0.945

All prices per pound unless quantity stated.



SARKOSYL surfactants are modified fatty acids in which the hydrocarbon chain is interrupted by an amidomethyl group. Physical and colloidal properties resemble those of the fatty acids, but the SARKOSYL products are more crystalline, more soluble (at acid pHs too), adsorb more strongly at interfaces. SARKOSYL acids and salts offer a range of solubility from mineral oil and silicones to 30% aqueous potassium hydroxide.

For pharmaceuticals, cosmetics, aerosols, detergents ... SARKOSYL NL30—water white, odorless, practically tasteless, low in toxicity, anti-corrosive, anti-enzyme; with lauryl sufate, synergistic combinations.

For petroleum products, fatty oils ... SARKOSYL acids for corrosion inhibition, water flushing, anti-oxidant properties.

® Geigy Chemical Corporation registered trade mark

SARKOSYL NL30	SARKOSYL L	SARKOSYL LC	SARKOSYL O	SARKOSYL S
sodium lauroyl sarcosine	lauroyl	cocoyl	oleoyl	stearoyl
	sarcosine	sarcosine	sarcosine	sarcosine



GEIGY INDUSTRIAL CHEMICALS

DIVISION OF GEIGY CHEMICAL CORPORATION SAW MILL RIVER ROAD • ARDSLEY, NEW YORK Chicago Portland Los Angeles Cincinnati New York





now available in commercial quantities

Latest news in intermediates is beta-Propiolactone (BPL), a starting material with remarkable versatility—difunctionality—that immediately suggests the synthesis of important new products. How can you use BPL—or its derivatives? In starch emulsions? In adhesives? In textile fibers? Why not find out immediately?

Write today for samples for your own evaluation, and for technical Bulletin No. N-61. Celanese Corporation of America, Chemical Division, Dept. 752.E, 180 Madison Avenue, N. Y. 16.



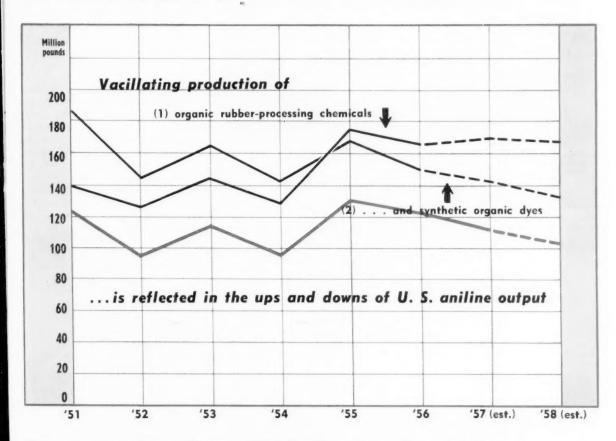
TYPICAL PROPERTIES OF CELANESE BPL

% min.	97
Physical state	Liquid
Color	Colorless
Odor	Pungent, acrylic
Boiling Point, deg. C.	162
Refractive index @ 20°C	1.4131
Specific gravity @ 20/20°C	1.1490
Pounds per gallon @ 20°C	9.56
Flash point, Tag open cup, deg. F.	165

Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16, N. Y.

See Chemical Materials Catalog and Chemical Week Buyers' Guide for complete listing of Celanese Chemical Products.

MARKETS



Erratic Aniline Still Seeks Stability

U.S. aniline production this year will drop to an estimated low of 104 million lbs.—21% under '55's peak of 132 million lbs. But this third consecutive year of declining output hasn't dampened the optimism of aniline producers. Watch the production curve turn up, they say, when general business conditions improve.

Consensus of aniline makers is that once the recession is over, the industry will live up to the forecast—made three years ago—that the traditionally erratic aniline production pattern is a thing of the past. The current production dip results from an abnormal economic condition, they aver, and does not represent the long-range trend of aniline production and consumption patterns.

Meanwhile, the recession's impact has pushed aniline production down. Output dropped 6.8%, to 123 million lbs., in '56; 8.3%, to 112.8 million lbs., in '57; and a likely 7.7%, to a low

mark of 104 million lbs., in '58.

As the chart (above) shows, aniline production closely parallels the composite production trends of rubber processing chemicals and synthetic organic dyes—both hard-hit by the slump.

Dyes Decline: Of these two consuming industries, dye manufacture—which takes 15% of total U.S. aniline output—has suffered a greater unchecked production decline since '55-

Total U.S. production of synthetic organic dyes has dropped steadily during the past two years—from a high of 168 million lbs. in '55, to 151.6 million lbs. in '56, to 142.9 million lbs. in '57. (Official '57 figures on synthetic-dye production won't be available for several months, but textile production indexes show a 5.8% decline in '57, compared with '56 indexes. Dye production, say some observers, probably declined about the same amount.)

Estimated dye production in '58 is 134 million lbs., 6.2% less than in '57, 20% less than in '55.*

Dyes—hence aniline—are hit two ways by the suffering textile industry: by declining retail sales of textiles, plus cutbacks in auto production (auto fabric sales are down). And abrupt style changes and changing fiber mixtures induce dye consumers to operate on low inventories.

Sources of concern, too, are the opposing—and unfavorable—trends in U.S. dye imports and exports. The value of U.S. dye exports has plummeted about 75% in the past decade, while the value of imports has soared about 150%. If these trends continue—and there's every indication they will—the value of U.S. dye imports and exports will soon balance out at

^{*}Dye production in '55 was not an all-time high. Although it exceeded the 165.8 million lbs. produced in '53—another good year—it was far short of '51's 187.1-million-lbs. total production.



PITTSBURGH PLATE GLASS COMPANY, Fiber Glass Division, Shelby, N. C. A 350,000 sq. ft. plant of completely air conditioned space housing the most modern concepts of Fiber Glass yarn production. Capacity—25 million lbs. per year.

DANIEL CONSTRUCTION CO.

An experienced corps of consultants and designers to work with you for a low cost competitive plant or enlargement.

LOCKWOOD GREENE

ENGINEERS-ARCHITECTS

Boston 16, Mass. 316 Stuart Street New York 17, N. Y. 41 East 42nd Street Spartanburg, S. C. Montgomery Bldg.

OVER A CENTURY OF INDUSTRIAL PLANT DESIGN EXPERIENCE

ULTRAGRAM

(up-to-date information on detergents, wetting agents and foaming agents)

ALL ABOUT:

SODIUM TOLUENE SULFONATE

a solubilizing hydrotrope for dry or liquid built detergents.

- is a conditioning and anti-blocking agent for built synthetics subject to high humidity
- reduces aging time of powders containing foam stabilizers by reducing stickiness
- increases considerably the solubility of dry detergents, and in liquid detergents it is a solubilizer and coupler for inorganic phosphates.

ULTRA "STS" is available as a 40% liquid in tank cars and tank trucks from Paterson and Chicago. Users without liquid storage facilities will find "STS" 85% powder attractive.

Send for a data sheet.



Headquarters for all your detergent needs

ULTRA CHEMICAL WORKS

Division of Witco Chemical Company 2 Wood Street, Dept. W5, Paterson, N. J.

MARKETS

about \$9-10 million/year (CW, Sept. 22, '56, p. 47).

But of greater concern, say some marketers, are U.S. imports of colored textiles, which cut deeply into dye consumption in this country. Although the ratio of dyed material to total textiles imported probably hasn't changed much in recent years, the total volume of each is growing. Most of the trouble involves natural fibers (e.g., wool from Britain, silk from Italy, cotton from Japan); imported synthetics have so far had little effect on the situation.

Rubber Chemicals Dip: The production decline of synthetic organic rubber processing chemicals since '55 has been less dramatic. The estimated output of 167.8 million lbs. in '58 is about 5.2% less than the 177.1-million-lbs. peak production in '55.

This decline, in effect, occurred in '56 when production of organic rubber chemicals dropped 5.7%, to 167.1 million lbs. A subsequent 2.5% production increase in '57 will be largely offset by the estimated 2% dip expected this year.

The over-all decline, though significant in its effects on aniline demand, in no sense erases the big production gain made in '55, when rubber chemicals production soared to 177.1 million lbs.—36% higher than the 129.9 million lbs. turned out in '54. But the production decline since '55 has contributed considerably to decreased aniline demand because manufacture of rubber chemicals takes about 60% of all aniline consumed in the U.S. when market conditions are normal.

Other Outlets: Dye and rubber chemicals production together account for about 75% of all aniline consumed in this country. The remaining 25% goes into a host of applications, no one of which is large enough to individually affect production of aniline very much. These minor outlets are: veterinary drugs, about 6% of total demand; drugs, 2.5%; photography, 1.5%; all other uses, 15%. It's likely that some or all of these consuming industries have had recent production cutbacks.

Use of aniline in explosives is believed to have dropped off somewhat, and its use as rocket fuel is considered too small to have much influence on aniline's end-use pattern; nonetheless, aniline will continue to be vital to rocketry until newer ma-



Technical services help customers use ROHM & HAAS METHYLAMINES with confidence

To assist customers, Rohm & Haas furnishes an 86-page book including most of the published data on the physical properties of the mono-, di-, and trimethylamines, suggestions for handling the amines in a safe manner, a description of the chemical reactions and uses of the methylamines, and methods for analysis of the commercial grades.

Rohm & Haas technical services include recommendations on the transportation of bulk quantities of methylamines, unloading, and the design of storage and handling facilities. These services assure safe working conditions to processors who use Rohm & Haas methylamines in the synthesis of rubber accelerators, fungicides, herbicides, photographic developers, dyes, pharmaceuticals, quaternary ammonium salts, rocket propellants, and surface-active agents. Write on your company letterhead to Dept. SP for your free copy of our book.



Chemicals for Industry

ROHM & HAAS

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

SOLVENT RECOVERY SAVES MONEY

SAVE 65% TO 80% ON PROCESS SOLVENT COSTS

Solvent recovery by the COLUMBIA Activated Carbon system is the efficient, economical way to recover solvents vaporized in manufacturing processes. Thus, it saves you money. Alcohols, esters, ethers, ketones, hydrocarbons, chlorinated compounds, and practically all mixtures of these solvents can be recovered and reused. And look at these facts . . . efficiency more than 99%: cost-1 to 2¢ per pound of recovered solvent. Thus, you save 65% to 80% on your process solvent costs.

Here's how solvent recovery works. Vapor laden air is drawn from the evaporation process and passed through a bed of COLUMBIA activated carbon. The solvent vapor is adsorbed on the carbon and the denuded air is discharged into the atmosphere. When the carbon becomes saturated, the vapor laden air is switched to a second adsorber.

Then, low-pressure steam drives the solvent out of the carbon bed and the steam-solvent mixture is condensed. If the solvent is insoluble in water, an automatic decanter separates the mixture If the solvent is water-soluble, distillation does the job.

CARBIDE can tell you how a solvent recovery plant can recover your process solvents. Write now for the booklet, "Solvent Recovery by the COLUMBIA Activated Carbon System." Address Department B, Union Carbide Olefins Company, 30 East 42nd Street, New York 17. New York.



UNION CARBIDE **OLEFINS** COMPANY

Division of Union Carbide Corporation 30 E. 42nd Street, New York 17, N. Y.

"Columbia" and "Union Carbide" are registered trade marks of Union Carbide Corporation.

MARKETS

terials are proved to be more effective.

Capacity Climbs: U.S. aniline capacity, according to one industry estimate, now amounts to some 200-210 million lbs./year, just about double this year's estimated output. General business recovery would no doubt boost production closer to total capacity.

At least some of the newer plant constructions have been spurred as much by the need of better-quality product as by growing demand. National Aniline's switch in '54 to the catalytic-hydrogenation (of nitrobenzene) method of aniline production initiated a virtual technological revolution in the industry. The new process not only allowed cost reductions but also yielded a purer, more stable product than could be made by the older method.* Capacity of the firm's Moundsville, W. Va., plant was doubled two years ago.

Following National Aniline's lead, other producers have been switching to catalytic hydrogenation. Du Pont, for example, has just begun construction of a new aniline plant at Gibbstown, N.J.; it will catalytically reduce nitrobenzene with hydrogen obtained from reforming natural gas.

American Cyanamid's new 24-million-lbs./year aniline plant at Willow Island, W.Va., went onstream a few weeks ago. This unit, too, is based on catalytic reduction with hydrogen obtained from natural-gas reforming.

Cyanamid's new plant will satisfy all the customers' requirements for aniline; the firm's older plant at Bound Brook, N.J., will continue to supply aniline for Cyanamid's captive needs.

Tennessee Eastman's new aniline plant-the company's first-is now onstream. Spokesmen are noncommittal about capacity or the process used, say only that output of the unit will be adequate for Eastman's captive uses and a "small amount" for

Other U.S. aniline producers are Dow Chemical and Naugatuck Chemical Division of U.S. Rubber.

It's obvious that U.S. aniline producers are readying for an expected long-term increase in demand. But it's also clear that they will have to await an easing of the business recession to find out if aniline can in fact free itself from its heretofore erratic supply/demand history.

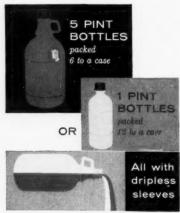
*Reduction of nitrobenzene with iron borings and hydrochloric acid.

USE AND DISPOSE! FISHER REAGENTS

in DISPOS-IT®

NO DEPOSIT bottles and cases





The ultimate in packaging and handling convenience and safety is yours when you buy reagents from Fisher. Shipped in tough ICC-approved corrugated cases, these highpurity Fisher reagents are available in 1-pint, 12-to-a-case units and 5-pint, 6-to-a-case units . . . all with safety "dripless" pouring sleeves . . . all at no deposit . . . all in disposable glass containers. (Even nitric acid is now available in 5-pint, 6-to-a-case units in a special lightweight wood Dispos-it!)

- glacial • sulfuric acetic acid
- acid • hydrochloric • ammonium hydroxide



Buffalo

Cieveland Detroit

Charleston, W.Va. New York Washington Toron

Philadelphia IN CANADA Pittsburgh Edmonton St. Louis Montreal

America's Largest Manufacturer-Distributor of Laboratory Appliances & Reagent Chemicals

Write for NEVILLE CHEMICALS ADMESIVES this FREE new。 Adhesives Formulae Manual

from

Neville 'Chemical's

Technical Service

Library

This 24-page booklet should be in the files of every company which faces the need for bonding such materials as paper, cloth, wood, rubber, aluminum foil, glass, plastics and a host of other materials to themselves or to each other. Sixty-six tested individual formulae are shown and mixing procedures described. Send in the coupon for your free copy. Water of the second of the second of the

NEVILLE CHEMICAL COMPANY · Pittsburgh 25, Pa.

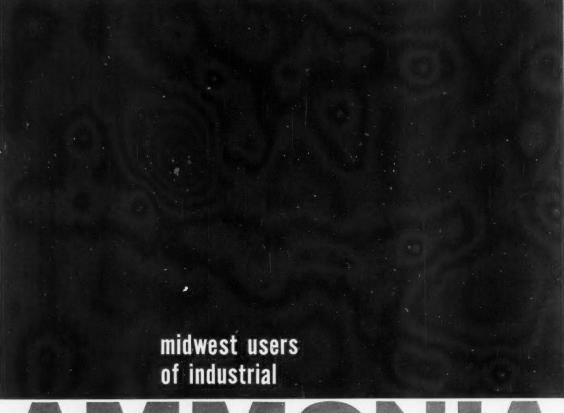
NEVILLE

Please send a free copy of "Neville Chemicals for Adhesives."

COMPANY

ADDRESS

CITY STATE



AMMONIA

get three vital services from Texaco Lockport, III. plant



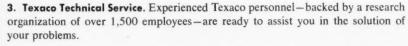
Whatever your uses for industrial ammonia—explosives, chemical synthesis, metal treating, plastics, petroleum refining, textiles, paper manufacture, refrigeration or any other—Texaco's Lockport, III., ammonia plant offers you:



1. Fast Delivery. Lockport is located in the heart of the midwest, convenient to major rail, water and truck routes—and there is a brand new transport fleet to assure on-time deliveries.



2. Ample Storage Facilities. You have a dependable supply of ammonia—available when you need it, to meet your own production schedules.



And, of course, you're sure that the ammonia you get from Texaco-Lockport will be absolutely pure and completely uniform, because Lockport's processing and handling equipment is *all new*.



TEXACO PETROCHEMICALS

Call or write The Texas Company, *Petrochemical Sales Division*, 332 South Michigan Avenue, Chicago 4, Illinois, or 135 East 42nd Street, New York 17, N. Y.



From Maine Log Piles, a Management Moral . . .

To a special group of 122 visitors to Maine recently, the log piles dotting the state's countryside gave evidence of a flourishing pulp and paper industry. But more than that, they symbolized the need for a dependable supply of managers to insure the industry's continuing vigor. Developing this management of the future is a major function of the University of Maine's Pulp and Paper Foundation, which recently treated 122 of its returning alumni to scenes of growth and progress. Occasion: the foundation's seventh annual Open House-Research Day.

Members of the foundation—mostly graduates of the university (many of whom had received foundation scholarships and grants)—toured pulp and paper facilities at the university during the two-day homecoming celebration. They saw new papermaking and coating equipment, watched impressive research experiments and talked with enthusiastic

... for Homecoming PPF Alumni

students (see photos). Included were 36 student recipients of foundation tuition scholarships and 15 recipients of grants for study under the foundation-sponsored five-year program for prospective managers.

Began 10 Years Ago: The foundation was born in '48 at a New York meeting of University of Maine pulp and paper alumni, when a five-year operational management course was suggested. Later, as a result of his suggestion to establish a foundation similar to that sponsored by the textile industry, Frederic Soderberg (class of '25, and presently a vice-president of the foundation and vice-president of F.C. Huyck & Sons) was asked to work out details of a five-year

curriculum for U. of M. students.

At an alumni meeting in Aug. '50, creation of the foundation was announced and its aims introduced to enthusiastic alumni. The new foundation dedicated itself to: attracting students to the university's course of study on pulp and paper; providing financial aid; screening outstanding students for the five-year operational management course; fostering advance fundamental and applied research for the pulp, paper and related industries.

Course Optional: The five-year management course is optional in the department of chemical engineering. It's specifically designed for students who indicate an aptitude and interest



Pulp and paper companies are prominent in PPF rosters.



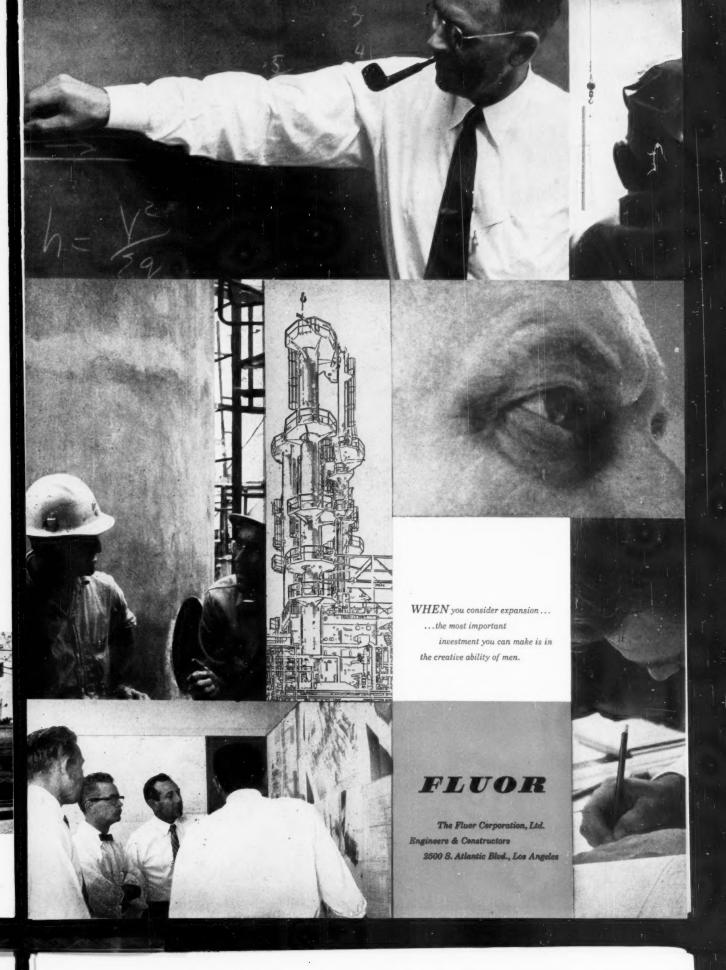
Albany Felt's Wayne Davis tells students that training programs will continue despite recession.



Registration for individual sessions was high.



Five-year U. of M. graduates talk over old times.







Student Bill Moulton (right, trio above) discusses fine points of paper-coating machine. Student

F. DeAlmeida-Neto (wearing glasses) describes progress made in eucalyptus experiments.

in management vocations, and it doesn't replace the four-year program or five-year course for the master of science degree. For management trainees, fourth- and fifth-year courses include labor problems, pulp and paper management, manufacturing and testing, business law and accounting. Students enrolled in the management program are expected to spend at least two summers working in industrial plants.

In '53, when the first group of foundation scholarship winners completed their degree requirements, foundation members decided that the industry's trained manpower needs were such that the scholarship base should be broadened to include qualified junior and senior engineering and forestry students. Now the scholarship program includes the entire college of technology and forestry at

the university. Qualified four-year students can receive grants in their third or fourth year upon stating that they intend to enter the pulp and paper industry after graduation. Five-year students can receive grants in any or all of their last three years of study.

Financed by Membership: The foundation's program is financed by five types of membership: (1) scholarship underwriters, companies (six at present) that contribute \$2,500 or more each year; (2) active members, individuals who give \$500 or more annually and companies that give \$1,000 each year; (3) individual members, persons who give \$2-\$500 annually; (4) special-gift members, companies giving less than \$1,000 yearly; (5) junior members, alumni graduated within the past five years, giving \$2 or more annually.

Total budget of the foundation for 1957-58 is \$108,700, almost double the previous year's budget. Scholarship awards were increased about \$10,000 and \$45,000 was budgeted this year for equipment to furnish a new laboratory building.

Scholarships and grants have been steadily increased in number and total cost since the foundation began — from \$3,000 for six scholarships in 1950-51 to \$32,000 for close to 50 grants and scholarshps this year.

Alumni reaction to the foundation is quite favorable. Typical is this comment to CW by Paul Coughlin (class of '54, and quality control superintendent, Eastern Corp.): "The financial assistance and use of equipment made available in part by the foundation enabled me to better prepare myself for work in the paper industry."

Foundation President J. L. Ober reminds members and students of industry-education relationships.



PERFECTED BY RESEARCH



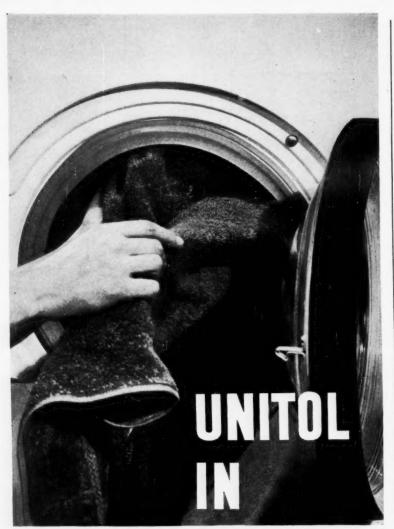
ETROLEUM SOLVENT

WATCH FOR NEW IMPROVED.

MARS

May 24, 1958 • Chemical Week

85



DETERGENTS

helps keep clothes clean

UNITOL tall oil goes into more quality products today than ever before. For example, it is proving an important ingredient in the manufacture of economical surfactants for household detergents.

Investigate the possibilities of cutting your costs with UNITOL products. Write for details, samples and prices.



Chemical Sales Division

UNION BAG-CAMP PAPER

CORPORATION
233 Broadway, New York 7, N. Y.

ADMINISTRATION

LABOR

Pressure on Cyanamid: International Chemical Workers Union is pressuring American Cyanamid in ICWU's strike at the company's Grafton, Ill., plant. Union members have been out since February in a dispute over changes Cyanamid wants to make in the contract. Cyanamid took over the plant from Illinois Powder Co. (CW, May 17, p. 44).

Now, ICWU has mounted a campaign to alert all members of the joint Oil, Chemical & Atomic Workers Union-ICWU American Cyanamid Council. The union is mailing out 8,000 folders calling on council members to:

- Urge their locals to contribute to the Illinois local either through assessments or through their local treasuries.
- Participate in a program for assistance to the Illinois local by the joint council.
- Inform management at other Cyanamid plants of resentment against "Cyanamid's high-handed actions."

Cyanamid management would not comment on the detailed accusations in the leaflet other than to say they are "inaccurate and misleading."

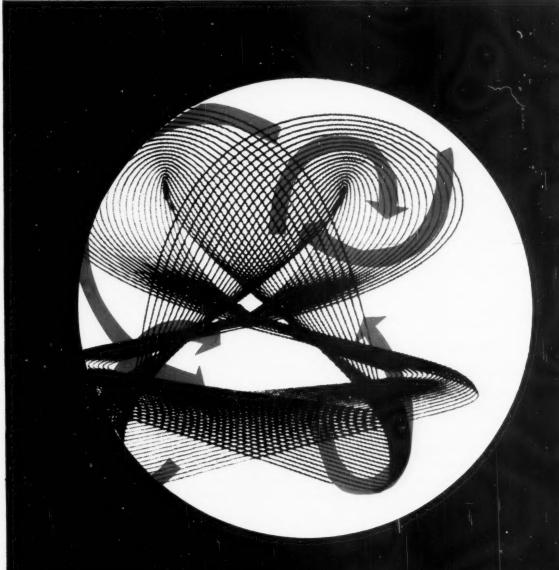
LEGAL

Sales Suit: A suit filed in federal district court at Shreveport, La., is an example of litigation over long-term sales contracts that can arise when the purchaser is taken over by another firm.

Commercial Solvents Corp. has brought suit, under an arbitration award, for \$425,023 against Louisiana Liquid Fertilizer Co.—now owned by Shreveport Chemical Enterprises, Inc.—and against Dow Chemical Co.

Commercial Solvents had charged in the arbitration proceedings that Louisiana Liquid failed to live up to a contract by which it allegedly agreed to buy 4,590 short tons of anhydrous ammonia annually from Commercial Solvents in the period 1953-60. But since the Shreveport firm bought Louisiana Liquid, ammonia, according to the complaint, has been purchased instead from Dow.

Commercial Solvents claims that



whatever the mixing job . . . a READCO mixer!

where complete dispersion is paramount . . . _ . where consistency, uniformity, quality count . . . you can count on READCO mixers!

READ STANDARD

YORK, PENNSYLVANIA

a division of CAPITOL PRODUCTS CORPORATION



IT WAS A BETTER MOUSETRAP, BUT:

Once (and not too long ago), there was a better product...lab tests proved it...the sales force sold it...the advertising moved it.

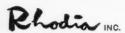
But the customers didn't come back.
The product was mis-odored.

No matter how efficient your product, if the odor overwhelms or isn't quite right, it can hit your customer wrong. And next time he'll unwittingly give up some quality for a better odor image.

An **ALAMASK®** reodorant chemical can solve the problem by directing the odor toward greater customer appeal.

Manufacturers of paints, waxes, cleansers, textile finishes, solvents, films, etc., etc., have proven in sales and repeat sales the real value of Alamask-ing their products.

Write or call today for Alamask samples and technical data to:



60 East 56th Street • New York 22, N.Y.
(Phone: PLaza 3-4850)
Representatives in:

Philadelphia • Cincinnati • Chicago • Denver Los Angeles • Montreal • Mexico City

ADMINISTRATION

Dow holds two mortgages on Shreveport Chemical amounting to \$3,182,-841.86. Reportedly, the Shreveport properties were to be sold to satisfy the mortgages, although a temporary order restraining the sale has been issued at CSC's request.

KEY CHANGES

C. Taylor Marshall to vice-president, Pittsburgh Coke & Chemical Co. (Pittsburgh).

Frederick W. Gage to vice-president, and Lyle E. Calkins to assistant secretary, Dayton Chemical Products Laboratories (West Alexandria, O.).

Harley L. Knauer to vice-president in charge of marketing, G. W. Carnrick Co. (Newark, N.J.).

Robert J. DeLargey to manager, Westvaco Chlor-Alkali Division; Raymond F. Moran to manager, Westvaco Mineral Products Division; Dewey H. Nelson to manager, Becco Chemical Division; Stuart H. Bear to manager, Niagara Chemical Division; Food Machinery and Chemical Corp.

S. A. Davis to president, C. K. McMillen to vice-president and treasurer, C. R. Hall to vice-president in charge of research, W. T. Hall to secretary, C. P. Hall Co. (Chicago).

Donald D. Pascal to president and chief administrative officer, Frank Greenwall to board chairman and chief executive officer, James Dillon to senior vice-president, Robert Merritt and Forest Teel to directors, National Starch Products.

Eric Foote to vice-president in charge of manufacturing operations, Diversey Corp. (Chicago).

R. N. Blaize, Jr., to president and chief operating officer, Eastern States Petroleum & Chemical Corp. (Houston, Tex.).

Russell W. Thatcher to administrative vice-president and director, B. T. Babbitt, Inc. (New York).

Nat C. Robertson to vice-president in charge of research and development and O. V. Luke to director of central research, Research and Development Division, Spencer Chemical Co. (Kansas City, Mo.).

Walter A. Munns to president, Smith, Kline & French Laboratories.



Chemical Reading from McGRAW-HILL

APPLIED STATISTICS FOR ENGINEERS

JUST PUBLISHED—Tells you in plain terms how to apply statistical methods to engineering problems—how to correlate data—how to treat experimental factors. Gives essential information on probability theory and frequency distributions. By W. Volk, Hydrocarbon Research, Inc. 354 pp., 27 fillus., 181 tables, \$9.50.

QUALITATIVE ANALYSIS

JUST PUBLISHED—Gives a clear, pertinent treatment of the principles of chemical equilibrium as applied no solution chemistry. Divided into theoretical and practical sections, it covers all important anions and cations in detail. Many illustrative numerical examples. By T. Moeller, U. of Illinois. 550 pp., illus., \$6.50.

UNIT PROCESS IN ORGANIC SYNTHESIS

5th ED. IUST PUBLISHED—Covers the principles and practices of reactions in organic synthesis in term of their underlying unit processes. Fully revised, the book deals with halogenation, sulforation, organisms, e. Ed.-in-Chief; P. H. Groggins, U. S. Dept. of Agric. 5th Ed., 937 pp., over 200 films, and tables, \$17.50.

EPOXY RESINS

Offers the whole range of information needed to make effective industrial use of epoxy resins. Applications include cold solders, porous casting impregnants, metal-to-metal glues, plus formulas, test data, etc. By H. Lee and K. Neville, The Epoxylite Corp. 503 pp., 176 illus., 87 tables, \$8.00.

CHEMICAL PUBLICATIONS

3rd ED. IUST PUBLISHED—Enables you to find your way more easily through the maze of modern chemical literature, showing you what sources of information are available, where they can be found, how to use them most effectively. Thoroughly revised edition keeps you abreast of today's chemical books and periodicals. By M. G. Mellon, Purdue U. 3rd Ed., 327 pp., illus., \$7.00.

10 DAYS	FREE	EXAMI	NATION

McGraw-Hill Book Co., Dept. CN-5-24
327 W. 41st St., N.Y.C. 36
Send me book(s) checked below for 10 days exam- ination on approval. In 10 days 1 will remit of book(s) I keep plus few cents for delivery costs, and return unwanted book(s) postpaid. (We padelivery costs if you remit with this coupon—same return privilege.)
Volk—Applied Stat. for Engineers. \$0.50 Moeller-Qualitative Analysis. \$8.50 Groggins—Unit Proc. in Org. Syn., \$17.50 Lee & Neville—Esoxy Resins, \$8.00 Mellom—Chemical Publications, \$7.00 (PRINT)
Name
Address
CityZone State
Company
Position
For price and terms outside U. S. write McGraw-Hill Int'l, N.Y.C. CN-5-24



... IN TEXTILES they permit increased speed and efficiency in scouring, warp-sizing, boil-off processes, dyeing and bleaching

... IN PAPER they improve absorbency of tissue and towels

. . . IN METALWORKING they protect "in process" metal parts against rusting

. . . IN ANY PRODUCT where surface conditioning is a factor

Nopco processing chemicals and Nopco research have brought about important economies in many fields. Quite possibly you could substantially increase the efficiency of one or more of your own processes by choosing and using precisely the right additive. Certainly the broad experience of Nopco chemists is your best assurance of finding the right one. Ask their advice—on wetting agents or anything else where practical chemistry can serve. Simply write or call our Technical Research Department. Nopco Chemical Company, Harrison, N.J.

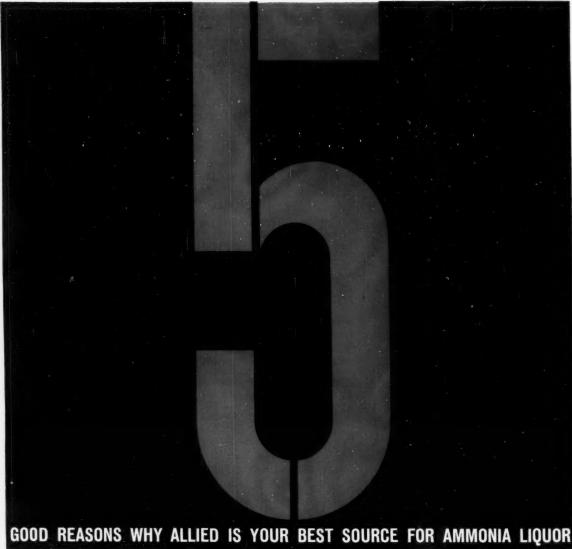
NOPCO



VITAL INGREDIENTS FOR VITAL INDUSTRIES

Lubricants • Detergents • Sizes • Plasticizers Softeners • Emulsifiers • Dispersing Agents Wetting Agents • Defoamers • Thickeners For complete information, see Chemical Materials Catalog, Page 378

HARRISON, N.J. • RICHMOND, CALIF. • CEDARTOWN, GA. • BOSTON, MASS. • CHICAGO, ILL. • LONDON, CANADA













1. Allied produces Aqua Ammonia at five strategically located plants. 2. All with transport truck facilities. 3. All geared to assure prompt shipment. 4. All operated by long-experienced personnel - Allied has been first in ammonia since 1890.

llied hemical 5. All Allied plants can supply you with the most complete technical data. Allied

You can't equalize ^ experience - Buy Allied

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate— 85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Ammonium Nitrate • Sodium Nitrate • Methanol • Nitrogen Solutions • Nitrogen Tetroxide • Fertilizers & Feed Supplements

- Nitrogen Division
- Department AL2-7-1
- 40 Rector Street, New York 6, New York



Record audience at chemical industry buyers' meeting hears International Minerals' Nelson White . . .

Answering Critics of Administered Pricing

Seizing the opportunity presented by a record turnout of chemical men at last week's 43rd annual convention of the National Assn. of Purchasing Agents, International Minerals' Nelson White publicly answered critics of administered pricing.

More than 240 price-conscious chemical buyers at Chicago's Conrad Hilton Hotel heard White (vice-president, Potash Division) defend administered pricing and plead for understanding and support of the practice. White contends that chemical buyers should pay a great deal more attention to competitive factors other than price.

Administered prices, he believes, "have become the new whipping boy" of the antibusiness critics. And it's essential, he added, that "we in industry meet this criticism. Meeting it calls not so much for defense as for explanation."

Administered pricing is pricing established by corporate policy based on marketing research and the interests of the consumer, employee and investor. As such, administered pricing is falsely equated with price fixing, elimination of competition, inflation, and now the recession.

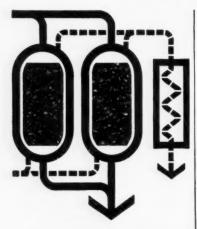
High profits, for example, have not caused the dip, White claims. National pretax corporate profit in '57 was \$40 billion, only 1 billion more than in '50. In the same period, White told the buyers, employee compensation rose \$100 billion.

Administered pricing aims at more than the three traditional functions of price—to sell, to recover costs and to yield a return on investment. Today, says White, corporate pricing must also aim at continued improvements in industry efficiency. These efficiencies must be translated into "more earnings for the investor, better wages for workers, lower prices and better products for consumers."

And that's just where the chemical buyer enters the scene. Purchasing and pricing policies must be compatible, says White, adding that the chemical buyer will never get improved products or services if he insists on driving the toughest bargain possible. This is especially true if the buyer's company follows administered pricing policies, he notes. "Simple morality and sound business practice both demand that we not operate under one set of rules as sellers, another set of rules as buyers."

Reciprocity considerations also demand purchasing men's cooperation with administered pricing. That's because the chemical industry is its own best customer and because "good trade relations are basic if the industry is to expand."

Does purchasing men's acceptance of administered pricing doom competition and reduce the importance of the purchasing function? No, says White. Competition, he holds, goes far beyond pricing. Purchasing men can choose sources of supply on the basis of service, product specifications, technical assistance and the interest shown by suppliers in the buyers' companies. Recent CHEMICAL WEEK market research studies, White asserts, clearly show that such factors



Barnebey-Cheney activated carbon solvent recovery systems are cutting costs in hundreds of plants by taking money out of the air. Air is circulated through resorbers, solvents are captured, available for re-use.



recover solvents

Don't let solvent vapors rob your profits, cause health, explosion, or pollution hazards. Recover them at a fraction of the replacement cost, sometimes for less than 2c/gallon.

activated carbon



We supply activated carbon, design and prefabricate complete recovery systems, ready to install, to meet your particular needs. Write us for recommendations and Bulletin No. 821. Barnebey-Cheney, Columbus 19, Ohio.

Barnebey Cheney

SALES

are important in competing for business in today's tighter markets.

Purchasing agents "should take a long, close look at the reputation and plans of suppliers in research and development—especially in the buyers' fields of interest. This consideration should be given greater stress in purchasing policies." Cooperation between vendor and supplier is the way, says White, to maximize profit to both parties, ensure continued growth and progress for the chemical industry.

Purchasing Intelligence: Attention in the convention's afternoon session shifted from administered pricing to purchasing fact-finding. Annual corporation reports, for the purchasing executive who can interpret them, can yield a wealth of data, said Chemical Fund vice-president, Donald Young, and Harvard Business School Professor Wilbur England.

Companies' annual reports can often tell buyers something about:

- Probability of supply continuity.
- Ability of supplier to expand.Extent of sales service and de-
- Extent of sales service and development work likely to be available.
 - Possibility of reciprocity.
 New-product developments.

Perusal of last year's reports showed, for example, Hercules's growing enthusiasm for polypropylene and its waning interest in cellulose acetate, explained Youngs Similarly, Corning Glass's report for '56 told of Radome Glass, a new material unveiled two months later as Pyroceram. But report-reading is full of pitfalls, said Young, warning buyers to make allowances for different accounting methods in comparing the performance of different companies and analyzing financial statements.

Harvard's England took a similar view in explaining the significance of various economic ratios (net sales/net worth, net sales/net inventory, etc.). Net sales/net inventory, he emphasized, is but a rough guide to a company's success in moving its inventory. Similarly, net profit/net sales can sometimes be a crude aid to negotiating purchase price.

Not all chemical purchasing agents are without reservations on all of the points discussed. But the viewpoints of White, Young and England were well received. Result should be more understanding of administered pricing, more searching questions triggered by annual reports.

Highest Quality

Fast Delivery

Personalized Service

BERKSHIRE ZINC CHEMICALS

- ▼ Zinc Nitrate
- ▼ Zinc Peroxide
- Zinc Ammonium Chloride
- ▼ Zinc Chloride

Berkshire Chemicals

420 Lexington Ave., New York 17, N. Y.

Sales Offices: New York • Chicago • Philadelphia
Cleveland • Boston • Pittsburgh • San Francisco



SULPHUR

- HIGHEST QUALITY 99.5% Minimum purity
- CONVENIENT DELIVERY
 Available in Crude,
 Bulk, Liquid
- DEPENDABLE LOW-COST SUPPLY

Mines at three locations on the Gulf Coast, Plants in Wyoming and at Fort St. John, British Columbia

JEFFERSON LAKE SULPHUR COMPANY

> Domestic Sales Offices Prudential Bldg. Houston 25, Texas

Aluminum CHLORIDE

The increasing use of Aluminum Chloride and the many new uses being found for it have led to a large increase in demand. In response to the need, Stauffer has increased production and refining capacity... is today, indeed, the country's largest producer.

PROMPT shipments of Anhydrous Aluminum Chloride are made from Houston, Baton Rouge and Elkton, Md., in drums of 600, 100 and 50 pounds net capacity.

Stauffer's Anhydrous Aluminum Chloride is made in granular or powder form, in six grades and numerous mesh sizes. Aqueous Aluminum Chloride is available on the West Coast only. Typical analyses of all grades of Stauffer's Aluminum Chloride comfortably surpass all specifications as to minimum $AlCl_3$ content, and maximum impurities.

Stauffer is also a major source of chlorides of Antimony, Boron, Silicon, Titanium and Zirconium. New book available on Metallic Chlorides; copies on request.

stauffer means service



STAUFFER CHEMICAL COMPANY

380 Madison Avenue, New York 17, N. Y.

Prudential Plaza, Chicago 1, III. • 636 California Street, San Francisco 8, Calif.

CHEMICAL WEEK . ADVERTISERS INDEX

May 24, 1958

Agency—G. M. Basford Co.	Agency—The Rumrill Co.	NATIONAL LEAD CO
AMERICAN MINERAL SPIRITS CO 5 Agency—Leo Burnett Co., Inc.	HOUDRY PROCESS CORP	ULTRA CHEMICAL WORKS
ANTARA CHEMICALS DIV. OF GENERAL ANILINE & FILM CORP	INLAND STEEL CONTAINER CO 69 Agency—Edward H. Weiss & Co.	UNION BAG-CAMP PAPER CORP 86 Agency—Smith, Hagel & Knudsen, Inc.
Agency—The House of J. Hayden Twiss ATLANTIC REFINING CO	JEFFERSON CHEMICAL CO 7 Agency—Hazard Adv. Agency	UNION CARBIDE CHEMICALS CO., DIV. OF UNION CARBIDE CORP. 45-78 Agency—J. M. Mathes, Inc.
BADGER MFG. CO 8-9 Agency—F. P. Walther Jr. & Assoc.	JEFFERSON LAKE SULPHUR CO 92 Agency—Bauerlein Adv., Inc.	U. S. INDUSTRIAL CHEMICALS CO 59-60 Agency—G. M. Basford Co.
	JOHNS-MANVILLE CORP. 4 Agency—J. Walter Thompson Co.	UNIVERSAL OIL PRODUCTS CO 42-43 Agency—Sam J. Gallay Adv.
BARNEBEY CHENEY CO. Agency—Odiorne Industrial Adv. Inc. BERKSHIRE CHEMICALS, INC 92 Agency—Marsteller, Rickard, Gebhardt & Reed,	KENNEDY CAR LINER & BAG CO., INC. 54 Agency-Poorman, Butler & Assoc.	WESTVACO MINERAL PRODUCTS CORP. 2nd Cover Agency—James J. McMahom Adv.
Inc.	KRAFT BAG CO	WITCO CHEMICAL CO 66-67 Agency—Hazard Adv. Co.
BINDER COOPERAGE CO	LOCKWOOD GREENE ENGINEERS, INC. 76 Agency—The House of J. Hayden Twiss	WYANDOTTE CHEMICAL CORP 58 Agency-Brooke, Smith, French & Dorrance, Inc.
Agency—Richardson, Thomas & Bushman, Inc.	LUMMUS CO., THE	
BLOCKSON CHEMICAL CO. 46 Agency—Wm. Balsam Adv.	MAAS & CO., A. R	tracers SECTION
BORDEN CHEMICAL CO., THE 2 Agency—Fuller & Smith & Ross, Inc.		(Classified Advertising)
	MCGRAW-HILL BOOK CO 88	F. J. Eberle, Business Mgr.
CELANESE CORP. OF AMERICA 74 Agency—Ellington & Co., Inc.	METAL & THERMIT CORP	CHEMICALS: Offered/Wanted
CHEMICAL CONSTRUCTION CORP 6 Agency—Godwin Adv.	MICHIGAN CHEMICAL CORP 18 Agency—Wesley Aves & Assoc.	EMPLOYMENT 95 EQUIPMENT: Used Surplus New For Sale 95
CHEMICAL MFG. CO 54 Agency—The House of J. Hayden Twiss	MINERALS & CHEMICALS CORP. OF AMERICA	WANTED 95
CHURCH & DWIGHT CO., INC 40 Agency—J. Walter Thompson Co.		MANAGEMENT SERVICES 95
COLUMBIA SOUTHERN CHEMICAL CO. 48-49 Agency—Ketchum, MacLeod & Grove, Inc.	MODERN WELDING CO	SPECIAL SERVICES 95
	NATIONAL ALUMINATE CORP. 44 Agency—Armstrong Adv. Agency, Inc.	
CONTINENTAL CAN CO	NEVILLE CHEMICAL CO. 79 Agency—Bond & Starr, Inc.	ADVERTISING STAFF
Agency—The House of J. Hayden Twiss	NOPCO CHEMICAL CO	Atlanta 3 Robert H. Powell, 1301 Rhodes-Haverty Bldg., JAckson 3-6951
CROWN ZELLERBACH CORP	ORONITE CHEMICAL CO	Boston 16 350 Park Square Building, Paul F. McPherson, HUbbard 2-7160
DOW CHEMICAL CO., THE 52-53 Agency-MacManus, John & Adams, Inc.	PATTERSON FOUNDRY & MACHINE CO., THE	Chicago 11 Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800
DRAVO CORP. 16 Agency—Ketchum, MacLeod & Grove, Inc.	Agency-Downing Industrial Adv.	Cleveland 15 Vaughn K. Dissette, 1510 Hanna Bldg., SUperior 1-7000
Agency—Fred Wittner Adv. 55	PROCON, INC	Dallas 1 Gordon Jones, The Vaughn Bidg., 1712 Commerce St., River-
EMERY INDUSTRIES, INC. 23 Agency—Frwin Wasey-Ruthrauff & Ryan, Inc.	PRODUCTS CORP	side 7-5117 Denver 2 J. Patten, 1740 Broadway, ALpine 5-2981
ESSO STANDARD OIL CO		Detroit 26 856 Penobscot Bldg., H. J. Sweger, Jr., WOodward 2-1793
FISHER SCIENTIFIC CO	RHODIA, INC. 88 Agency—Sudler & Hennessey, Inc.	Frankfurt/Main Michael R. Zeynel, 15, Landgraf-Wilhelm, Germany
FLUOR CORP., LTD., THE		London H. Lagler, McGraw-Hill House, 95 Farrington St., E.C. 4, England
GEIGY INDUSTRIAL CHEMICAL CO 73 Agency-Ciangio Adv. Inc.		Los Angeles 17 John B. Uphoff, 1125 West Sixth St., MAdison 6-9351
GENERAL AMERICAN TRANSPORTATION CORP. WIGGINS DIV	SILICONES DIV OF UNION CARRIDE	New York 36 Knox Armstrong, B. A. Johnson, P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959
GENERAL CHEMICAL DIV. ALLIED CHEMICAL CORP.,	SOLVAY PROCESS DIV. ALLIED CHEMICAL CORP	Philadelphia 3 . William B. Hannum, Jr., Architects Bldg., 17th & Sansom Sts., RIttenhouse 6-0670
GENERAL MILLS, INC		Pittsburgh 22 V. K. Dissette, Room 1111 Henry W. Oliver Bldg., ATlantic 1-4707
GOODYEAR TIRE & RUBBER CO I	STAUFFER CHEMICAL CO	San Francisco 4 William C. Woolston, 68 Post St., DOuglas 2-4600
HERCULES POWDER CO		St. Louis 8 3615 Olive St., Continental Bldg., R. J. Claussen, JEff- erson 5-4867

To the Smaller Chemical Specialty

manufacturer who needs a lift, Highly ex-perienced, versatile industrial and consumer products chemist with ideas and products is interested in acting as consultant on a reason-able fee or retainer basis.

\$5-8003 Chemical Week Class. Adv. DIV. P.O. Box 12, N.Y. 36, N.Y.

CHEMICAL SALESMEN

CHEMICAL SALESMEN
Degree & 3.5 years' exp. for expanding nat'l organic chemical mfr. Train for Eastern and other locations. Salary.

EXCELLENT OPPORTUNITY
EXCELLENT OPPORTUNITY
For interview appt send resume & salary reqd.
(Confidential). Address.

PERSONNEL DIRECTOR
HEYDEN NEWPORT CHEM CORP
342 Madison Ave. N.Y. 17,

ADDRESS BOX NO. REPLIES TO: Bos No. Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Mickigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITION WANTED

Industrial solvents cleaning maintenance compounds, Sales administration specialist will assist sales manager, develop new markets, train sales-nen, PW-8037, Chemical Week.

anagement

- General Consulting . Instrumentation
- Management
- Equip. DesignCatalyst Patents
- Systems
- Development • Translation Engineering • Translation
 • Chemical & Bacteriological Analysis

JAMES P. O'DONNELL"

Consulting Engineer

Professional Engineering for the Petroleum and Process Industries 39 Broadway New York 6, N. Y. Begumont, Texas

FOR SALE

Unused 20,000 Gallon Horizontal Stainless Steel Tank with internal baffle. Perry, 1415 N. 6th St., Phila. 22, Pa.

Devine 3' x 8' Rotary Vacuum Dryer, Teflon lined (can be used in application requiring st. st.) Perry, 1415 N. 6th St., Phila., Pa.

30,000 Gallon Horizontal Propane Tank; ASME 200# W.P. Perry, 1415 N. 6th St., Phila. Pa.

For Sale—4-500 gal. stainless tanks with stands; 100 gal., 1-150 gal., 2-100 gal., and 1-1275 ch, stainless steel mixing tanks with agitate AC motors, covers, etc., like new. Buy one of all, subject to prior sale. FS-8025, Chemical Week

For Sale-Louisville steam tube dryer, 8' dia. x 36' long, with practically new grain dewatering press, erected in Pa. plant, immed. delivery, real bargain, details, FS-8033, Chemical Week.

Stainless Steel Drums (for storage) excellent condition-55 gal. cap. lots of ten-\$550 F.O.B. Bors-Sherman Co., Sinclair Bldg., Steubenville,

When Answering BOX NUMBERS . .

to expedite the handling of your correspond-ence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

Employment Opportunities

ITALY

- Importers & wholesalers established in Milan from over half a century
- · Wide experience in heavy and pharmaceutical chemicals and intermediates.
- Own warehouses, national distribution chain
- Ready to represent first class manufacturers interested in exporting to Italy
- · Banking and trade references on request

Reply to RA-7841 Chemical Week Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

TECHNICAL SERVICE — SYNTHETIC DETERGENTS Formulation work, sales development & technical service in field of synthetic detergents. Will handle industrial, household and cosmetic products on stoff-polition N.Y. area. Indicate qualifications, experience and sales desired.

P-7878 CHEMICAL WEEK Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

CHEMICAL SALES

Petrochemical raw material manufacturer needs more chemical salesmen to further en-large marketing staff for nation-wide sales to paint, plastics, rubber, petroleum and chemical industries. Excellent opportunity for men 25-38 who meet these requirements.

- 1. Minimum BS in Chem, or Ch.E.
- Two or more years' experience selling organic chemicals to industry.
- Ability and strong desire to advance as company grows.
- 4. Self-motivation.

• Sett-motivation.
Company is completely integrated subsidiary of one of the nation's top twenty industrial corporations. This assures our employees stability, security and liberal benefits. In addition, the relatively small size of Amoco Chemicals assures recognition of individual achievement. Salary commensurate with experience and demonstrated ability. Give details of age, education and experience in first letter.

H. F. Holdridge

Amoco Chemicals Corporation 910 South Michigan Avenue Chicago 80, Illinois

Tracers to the Chemical Process Industries

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS PLASTICIZERS, RESINS, DYES SOLVENTS, PIGMENTS, ETC.

CHEMICAL SERVICE CORPORATION 96-02 Beaver Street, New York 5, N. Y. HAnover 2-6970

BUYERS OF CHEMICALS

CHEMICALS-OILS-SOLVENTS DRUGS-RESINS-WAXES PLASTICS-COLOR-ETC.

BARCLAY CHEMICAL COMPANY, INC. 75 Varick Street New York 13, N. Y. WORTH 4-5120

CUSTOM GRINDING"

- · Ultra Fine or Coarse
- · Specialty or Volume
- · Heat Sensitive Materials
- Complete Blending and Grinding service on unit or contract basis
- A. Cramer Corp. 10881 S. Central Avenue Box 682 Oak Lawn, Illinois

For Sale =

Free Catalog! Fort Pitt Brewery, Pittsburgh-16-page, 2-color illustrated catalog showing all processing equipment in this plant, which ceased operations in November. Thousands of dollars worth of equipment being sold piecemeal for mere fraction for immediate delivery. Write to: Chas. S. Jacobowitz Corp., 3082 Main St., Buffalo 14, N.Y. Telephone: AMherst 2100.

BUSINESS OPPORTUNITIES -

50 Acres, R.R. siding and all utilities, 20 min-utes from midtown New York, Newark, Jersey City, Paterson, any type heavy or light industry, good transportation, low taxes, labor available, \$7,500/acre. BO-7911, Chemical Week.

Don't Forget

the box number when answering advertisements. It's the only way we can identify the advertiser to whom you are writing.

EXTRACTS WANTED

Aloin, Podophyllin, Rhubarb dry extract, Aloe dry extract, buckthorn dry extract, Stramonium dry extract, Jalap root dry extract, Culvers root dry extract, Pyre-

Give prices and quantities available.

W-8047 Chemical Week 520 N. Michigan Ave., Chicago 11, III.

SURPLUS CHEMICALS WANTED

Chemicals-By-Products-Plasticers

Pigments-Resins-Solvents

CHEMSOL, INC.

70 Dod Street, Elizabeth N.J. EL 4-7654

CHEMICAL LABORATORY WANTED

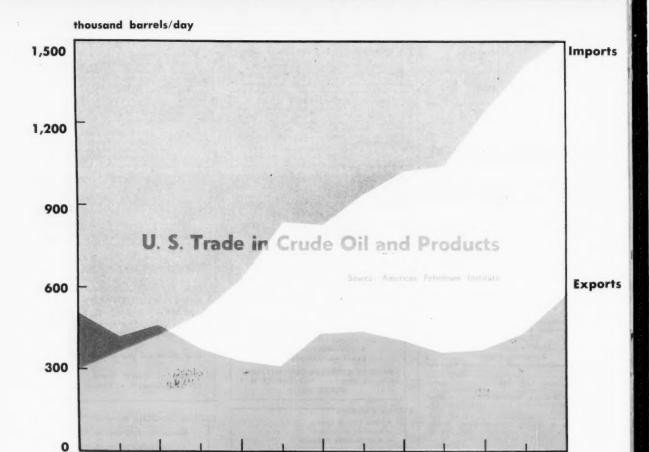
or building suitable for conversion to such. West coast location preferred, others will be considered. Will rent or purchase.

Montrose Chemical Company 104 Lister Avenue, Newark, New Jersey

\$50,000 TO INVEST BY CHEMICAL ENGINEER

As active participant in sound chemical business. Extensive business background in Man-agement and sales,

BO-8045 Chemical Week Class. Adv. DIV. P.O. Box 12, N.Y. 36, N.Y.



Oil-Imports Bill Kindles a Controversy

151

The petroleum refining industry is keeping a sharp eye on the progress of proposed legislation involving the industry's basic raw material. The issue in question is the "Producers' Bill," introduced by Rep. F. Ikard (D., Tex.). It would limit the volume of crude-oil and oil-product imports to 16.6% of domestic production for a calendar year, with output estimates revised quarterly. Imports of crude oil have been skyrocketing; they averaged some 1.6 million bbls./day in '57 compared with 1 million bbls./day in '53.

'47

Independent domestic producers favor restrictions,

say they have been severely hit by rising imports.

On the other hand, domestic producers operating internationally contend that growth of natural gas, a product of domestic oil producers, has contributed heavily to the declining importance of oil in the U. S. energy market. They favor unrestricted oil imports, citing the future drain on U. S. oil reserves. They state that demand for crude oil should hit some 14.3 million bbls./day in '66, compared with 8.8 million bbls./day in '56. This they weigh against known U. S. reserves estimated to be sufficient only for 10 years.

155

157

45



Pentachlorophenol is widely used as a wood preservative. In addition, its water-soluble sodium salt today finds increasing application as a preservative for water base paints, adhesives, textile finishes, paper and fiberboard. Pentachlorophenol is especially effective as an inhibitor of bacterial attack, and as a protection against mold and fungus growth. If you need pentachlorophenol or sodium pentachlorophenate, call RCI. You can expect fast, dependable delivery from RCI, with its network of warehouses all over the country.

Synthetic Resins • Chemical Colors • Industrial Adhesives • Phenol Hydrochloric Acid • Formaldehyde • Glycerine • Phthalic Anhydride Maleic Anhydride • Sebacic Acid • Ortho • Phenylphenol • Sodium Sulfite Pentaerythritol • Pentachlorophenol • Sodium Pentachlorophenate Sulfuric Acid • Methanol

REICHHOLD

REICHHOLD CHEMICALS, INC., RCI BUILDING, WHITE PLAINS, N.Y.



TAMED: the elemental fury of fluorine!

Still thinking of elemental fluorine as "too hard to handle"? Not any more! As a result of General Chemical research, this "optimum" oxidizer can now be stored, transported and handled directly as a liquid in tank-truck tonnages. If you are interested in working with fluorine as an oxidizer for rocket fuels, or for any other application, this development could be of major importance to you.

Benefits of liquid fluorine. Now

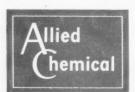
that fluorine is available in liquid form and in bulk quantities, you can handle and store it more easily, more safely and more economically than ever before. An important plus value—the shipping containers can also be used as storage tanks.

Halogen fluorides also available.

The halogen fluorides, too, are commercially available from General Chemical. Chlorine trifluoride is available in ton cylinders and cylinders of 150 lbs. net. Bromine trifluoride, bromine pentafluoride and iodine pentafluoride are offered in various-sized cylinders to suit demand.

Write for free technical bulletins.

A comprehensive new technical bulletin, "Fluorine," will be sent you on request. Also Technical Bulletin TA-8532-2, covering Chlorine Trifluoride and other Halogen Fluorides. Write for your free copies today.



First in Fluorine Chemistry

GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N. Y.